



MASTER OF ORION II

BATTLE AT ANTARES™

THE OFFICIAL STRATEGY GUIDE

JOHN POSSIDENTE
DAVE ELLIS

MICRO PROSE

Strategies
you'll find
nowhere
else!

Master of Orion II: Battle at Antares

The Official Strategy Guide

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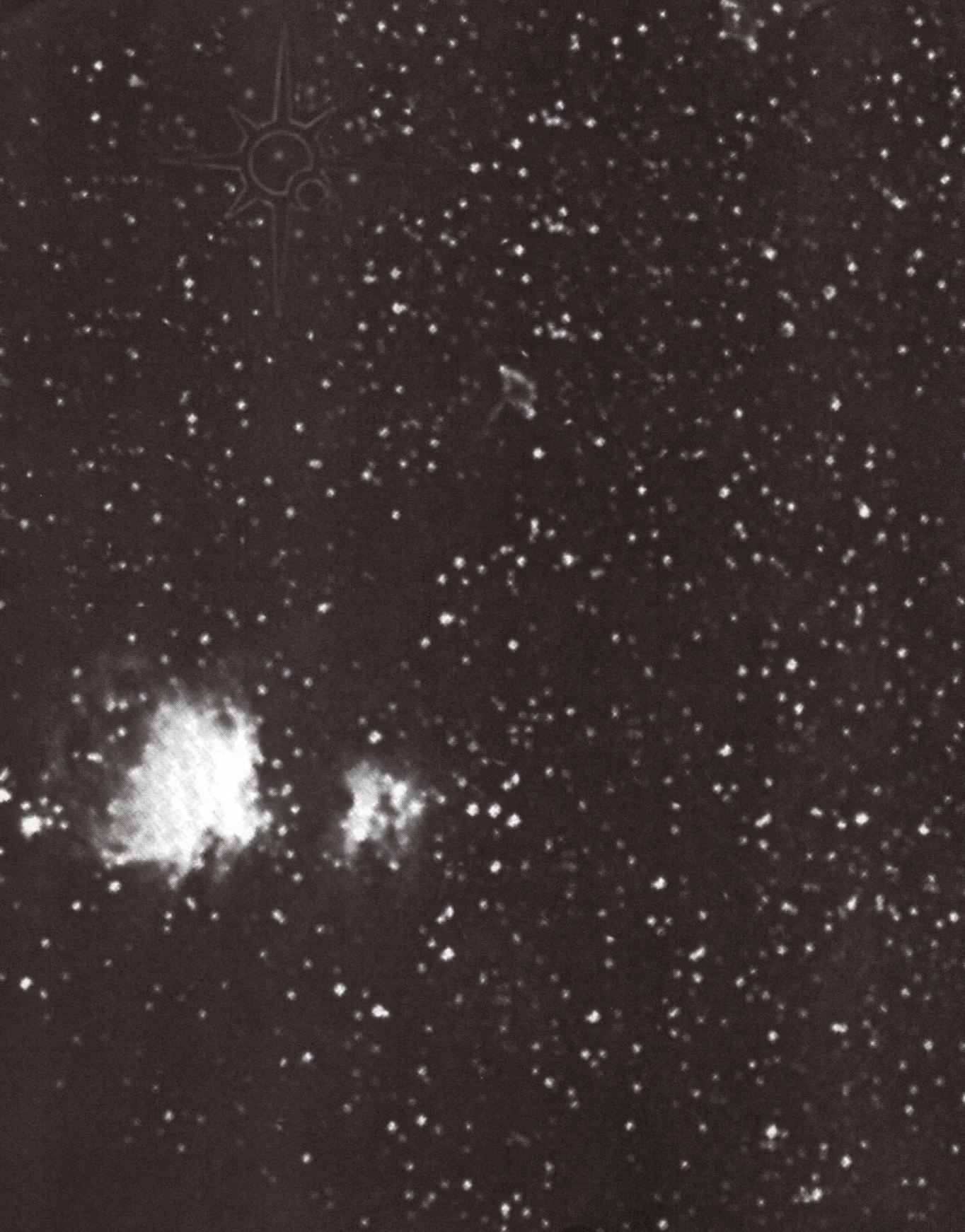
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CHAPTER 1

WHAT'S NEW IN MOO II?



FEW YEARS BACK, a little company called SimTex created and released a game of galactic conquest known as *Master of Orion*. It became an instant hit, won numerous awards, and earned a place beside such revered strategy games as *Civilization* and *Railroad Tycoon*.

Shortly after releasing *Master of Orion* (affectionately dubbed MOO by those who know the game best), SimTex teamed up with the game's distributor, MicroProse, and released another hit—*Master of Magic*. *Master of Orion*'s popularity continued unabated, and fans of the game looked forward to a sequel.

Thus, *Master of Orion II: Battle at Antares* was born.

MOO and MOO II share a number of definite, underlying aspects, but many game elements were added, removed, or drastically altered in the sequel. If you thought being an expert at the first game would make MOO II a cakewalk, you probably realized your mistake early on. (Why else would you be reading this book?)

This chapter primarily compares the new game with its predecessor for the benefit of game veterans; however, players getting their first taste of interstellar empire building with *Master of Orion II* can use the following information as a good overview. The rest of this guide presumes a basic, working knowledge of the concepts outlined here.



Note

While we're on the subject of presumed knowledge, we should mention that this book is *not* meant to replace the game manual. If you want explanations of basic interface elements and gameplay procedures, *you're looking in the wrong place!* Read the manual.

WINNING THE GAME

HALL OF FAME	
Time (982 turns)	0
82 Population	82
Players Eliminated	0
0 Captured Colonists	0
Technology	227
Captured Orion	100
Defeating Antaran Homeworld	250
Total Score	659

FIG. 1-1. VICTORY!

Beating *Master of Orion* was always a rather involved process. Well, some of it was pretty straightforward: You set out to conquer as many worlds as you possibly could. With only two races, victory went to the last race left alive.

When there were more than two races involved, things got complicated. Once two-thirds of the galaxy was colonized, the Galactic Council (a governing body made up of a member from each race in the game) would vote on who, between the two largest empires, should rule the galaxy. They considered a number of factors, including achievements and political status. If you accepted the council's verdict, the elected race won the game. Otherwise, the war—er, game—would continue until the next council meeting, in 25 years.

In MOO II, the goal is the same: Defeat the other races and rule the galaxy. However, this game's universe is a bit less civilized than MOO I's. The Galactic Council is history. Now, if you want to win, you generally have to rely on brute force.

There are two circumstances in which you won't have to slaughter your enemies to win. If you achieve a significant advantage over your opponents, they may offer terms of surrender. You can accept their terms and become the uncontested ruler of the galaxy, or you can continue on your course of bloodlust until you've conquered everyone by force.

The second nonviolent (well, sort of) road to victory is to defeat the Antarans. The Antarans are xenophobic, transdimensional creatures whose only goal is to destroy all other life in the galaxy. They can do it, too; their technology far surpasses that of the game's other races. If you can defeat the Antarans by destroying their home world, you so impress your other opponents that they immediately submit to your rule, ending the game.

The Galactic Council still exists in MOO II, and ignoring their decision still leads to total war. They're no more of a factor than before, however. Most players don't take the Council too seriously.



COLONIES

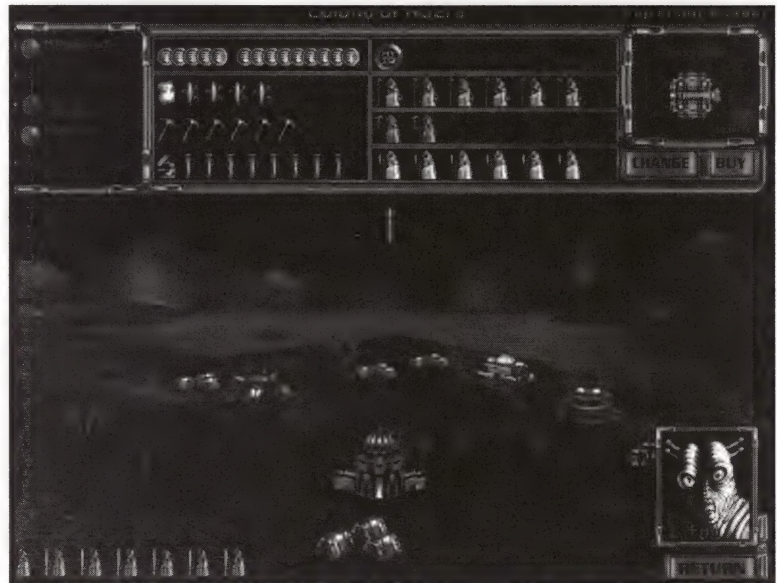


FIG. 1-3. MONITORING COLONY STATUS IN MOO II.

One of MOO II's biggest differences involves establishing and managing your colony worlds. In the original game, every star had a single planet. When you colonized a new world, a simple status screen (overlaid beside the galaxy map) displayed everything you needed to know about your colony. To manage it, you effectively balanced five resource categories: ship production, missile base production (planetary defense), factory production, ecology (pollution control), and technology (scientific research). If you could optimize production without destroying the planetary environment, you were good to go. (See Figure 1-2.)

Unfortunately, things aren't quite so simple now. First, you can establish multiple colonies in a single star system. Colony management and growth takes on a *Civilization*-like complexity. Not only must you manage your production, technology, defense, and planetary pollution levels, you also must monitor food production and colonist morale. To make matters worse, management is no longer a matter of moving a few slider-bars. Now, the colony structures you build and maintain must improve and stabilize various aspects of your worlds, and you must move colonists from job to job to optimize industrial production, food production, and scientific research. (See Figure 1-3.)

Chapter 5 offers details and strategies on running your colonies.

INDUSTRIAL PRODUCTION

The original game's multiple production types now make up a single category. Each colony can produce only one item at a time. In other words, you cannot produce a ship, a defensive structure, and a factory simultaneously. Instead, you must place all your production orders in advance. (See Figure 1-4.) When one item in the production queue is completed, the next on the list automatically goes into production.

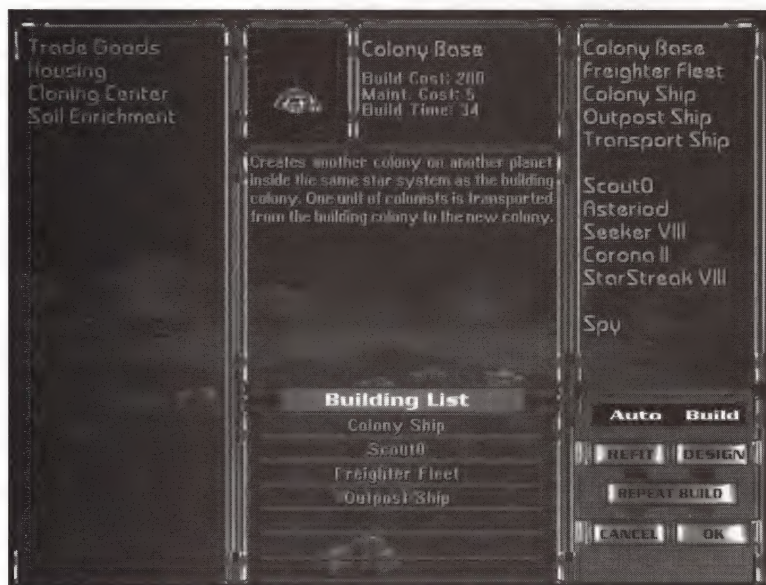


FIG. 1-4. PLACING ORDERS FOR COLONY PRODUCTION.

FOOD PRODUCTION



Unlike the original game, you now must feed your colonists. If food is insufficient, the colony stops growing and, eventually, colonists begin dying off. To produce food, some colonists must work in the fields. The number of farmers you need depends on planetary population, environment, your race's attributes, and the kinds of structures you build.

COLONIST MORALE



Another bit of MOO II colony management that wasn't a factor in the original game is morale. As colonial population grows, colonist

morale may begin to decline. Happy- and sad-face icons indicate the population's mood, each representing a production bonus or penalty. You must constantly monitor population morale, and take steps to improve the outlook of unhappy colonists as quickly as possible.

CAPTURING RIVAL COLONIES

Capturing enemy colonies in MOO II differs from the original game in a number of ways. Many of these are relatively minor (Chapter 7 explores them in detail).

One major difference, however, is assimilating a captured colony's remaining population into your own culture. Each race has a corresponding rate of colonist assimilation, indicating the number of turns it takes to bring one enemy colonist around to your way of thinking. The assimilation rate is based on racial attributes and your government type.

Until they assimilate, captured enemy colonists are 25 percent less productive than average. The quicker the assimilation time, the faster you can bring a colony back to peak production efficiency.

RESEARCH



Colonists conduct scientific research (as they do industrial and food production). Each colonist you assign to research new technologies produces a number of Research points (RPs). Your total colonial RPs at the end of each turn are applied to research in progress. The more colonists you assign to science, the faster you discover new technologies. This is similar to the way research was conducted in the original game.

MOO II varies in that, under normal circumstances, you can only research one practical application in each field of study. Most fields offer three or more options. (See Figure 1-5.) When you choose your field of study, you must also choose the application you want from that field. When you complete research, you gain the ability to build the chosen application. The catch is this: *You never get the opportunity to research the other applications in that field.* This rule doesn't apply to all races, but in most cases you must follow this system.

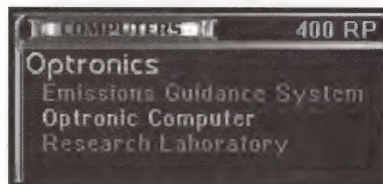


FIG. 1-5. THE TECHNOLOGY SELECTION PROCESS.

Worse, if your race is Uncreative, many technological applications available to your opponents may not be available to you when you choose your research topic. (For details, see Chapter 6.)

LEGENDARY LEADERS



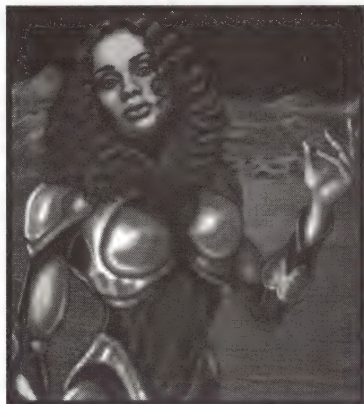
FIG. 1-6. A LEGENDARY LEADER OFFERS HER SERVICES.

MOO II's legendary planetary leaders and starship officers can be invaluable for colony management and starship combat. From time to time, you have the opportunity to hire a leader and assign him or her (or it) to a colony or ship. (See Figure 1-6.) Each leader has special abilities in various aspects of combat and colony management. In desperate situations, the bonuses you gain by having a legendary leader on the job can mean the difference between victory and defeat.

See Appendix B for details on the abilities of the game's legendary leaders.

NEW AND CUSTOM RACES

Most of *MOO II*'s character races will be familiar to *Master of Orion* veterans. However, three races are new—the mentally gifted, elf-like Elerians;



the money-grubbing, lucky Gnomams, and the aquatic, transdimensional Trilarions.



When it comes to choosing a race to play, perhaps the game's best new feature is the ability it gives you to create a race of your own design. Choosing racial characteristics from a richly varied list of advantages and disadvantages, you can create an endless number of unique races. (See Figure 1-7.)

Chapter 3 provides details on new and customized races.

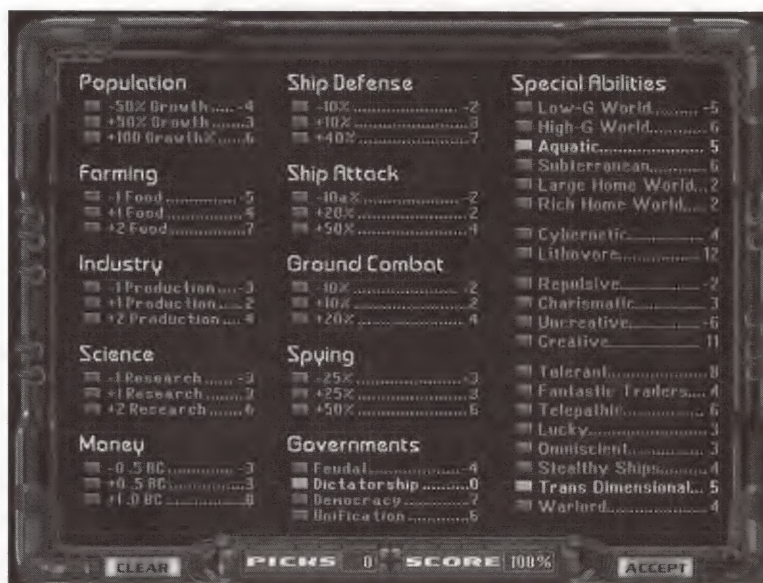


FIGURE 1-7. CREATING A CUSTOM RACE.

CHANGES IN THE ARTIFICIAL INTELLIGENCE (AI)

The way the computer plays against you varies somewhat from the original game. Of course, all the programming improvements you'd expect in a sequel are in place—your computer-controlled enemies are a bit smarter and more ruthless.

The biggest difference lies in your opponents' pre-disposed behavior toward you and their outlook on life, the galaxy, and everything. AI leaders still have distinct personality traits and objectives. However, gone now are the hard-coded attitudes and behaviors present in the original game. When it comes to enemies and allies, all races start with a clean slate. The Alkari and the Mrrshans no longer hate one another, the Humans are not automatically everyone's ally, and so on. Computer-controlled races also lack the scientific advantages and disadvantages they had when it came to certain predetermined lines of research.

Instead, each race issues from the same custom-race matrix. Your opponents each have a combination of advantages and disadvantages, just like you. These factors determine much of their game performance, and make each race truly unique.

MULTIPLAYER CAPABILITY

Sure, beating up on those smarmy, computer-controlled races can be satisfying and fun, but it's even more fun to utterly defeat and humiliate a close, personal friend.

Master of Orion II's biggest and most anticipated feature is its multiplayer capability. Whether you face two players head-to-head via modem or eight players simultaneously over a LAN or the Internet, there's nothing like playing live opponents. Of course, playing against real people means you'll have to come up with brand-new strategies to succeed.



CHAPTER 2

JUST SURVIVING



THE UNIVERSE IS OUT TO GET YOU.

You never seem to survive past the first hundred turns. No matter what you try, something or someone always comes along and destroys your infant empire before you really get on your feet. Your population is always starving and miserable, your treasury is emptier than deep space, you never produce anything worthwhile, and then a space eel builds a nest on your capital planet.

Sound familiar?

Even if it's not quite that bad, getting cut out of the galaxy early in the game is frustrating, at best. Unfortunately, the first hundred turns are the foundation on which you build the rest of your empire. Sure, given enough time, you can overcome a bad start, but you'll rarely get that time.

Better to start on the correct lower pedal extremity.

SET UP FOR FAILURE

The decisions you make as you set up the galaxy can make or break your empire. This may seem obvious, but take a moment to examine the games you've been playing; you could be losing the game before you even start.



THE GAME SETUP SCREEN

Difficult games are difficult. This is the most obvious and the easiest way to bring the game down to your level—lower the Difficulty Level! There's no shame in it. A novice playing on Impossible or Difficult will get scragged every game. If you're already playing on the Tutor setting and still losing, keep reading.

Small is trouble. If you need time to get your empire in order—and most players do—playing in a Small galaxy is asking for trouble. When the stars are jammed tightly together and there aren't very many of them, the competition for planets and resources is ferocious. As soon as interstellar travel becomes possible, the other races expand and find you quickly. That means they start trying to wipe you out earlier in the game.

Buy yourself some time by choosing a larger galaxy. In fact, sometimes you can play out an entire game in a Huge galaxy and *never* encounter another race.

More is *not* better. Especially in smaller galaxies, the number of competitors drastically changes your odds of survival. If there are only two or three of you, each empire has room to spread out peacefully for a while. It might be hundreds of turns before you even make contact, and that's to your advantage. Yes, playing with eight races (especially stuffed into a small space) makes the game more interesting, but it also means that somebody—maybe you—gets in trouble quickly.

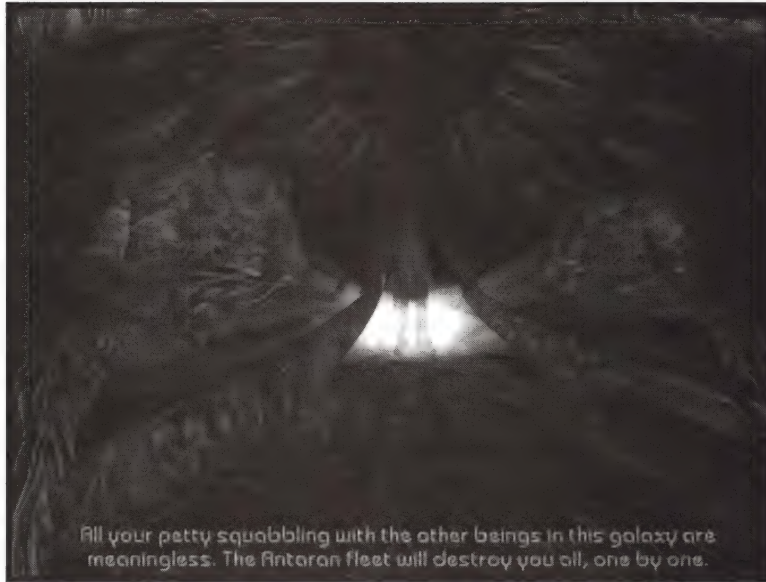
Save the fun of really interesting, challenging setups for when you've nearly mastered the game. More races means more enemies searching for you, more empires desperate for good planets, and an increased chance that the others will ally against you. Even expert players have trouble fighting a war on two fronts. Spare yourself the stress and start with fewer competitors in the ring.

Start small. Starting out with a lot of advanced equipment, some ships, and several colonies sounds good, doesn't it? The trouble is, you don't gain any advantage by it; every empire begins with a similar setup. Start with Advanced Civilizations and it's extremely likely you'll come into contact with your opponents almost immediately. After all, the existing empires take up half the galaxy, and everyone begins with ships. Instant war is virtually inevitable, especially when aggressive players are involved.

Besides, if you have trouble managing one colony, what makes you think several will be any easier? A reliable way to buy yourself time early in the game is to begin at Pre-Warp level. Direct your research toward getting FTL (Faster Than Light) as quickly as possible (which the computer-controlled races do not do), and you can get a jump on expanding your empire.

Disasters are bad news. Yes, turning off the Random Events makes the game less interesting. However, if you seem to be bearing the brunt of them, consider it. This one action takes care of plagues, pirates, ship explosions, hyperspace fluxes, and all the rest. Also, your colonies no longer play host to those space-monster mating dances. (The Galactic News Network is reduced to commenting on the progress of the game.)

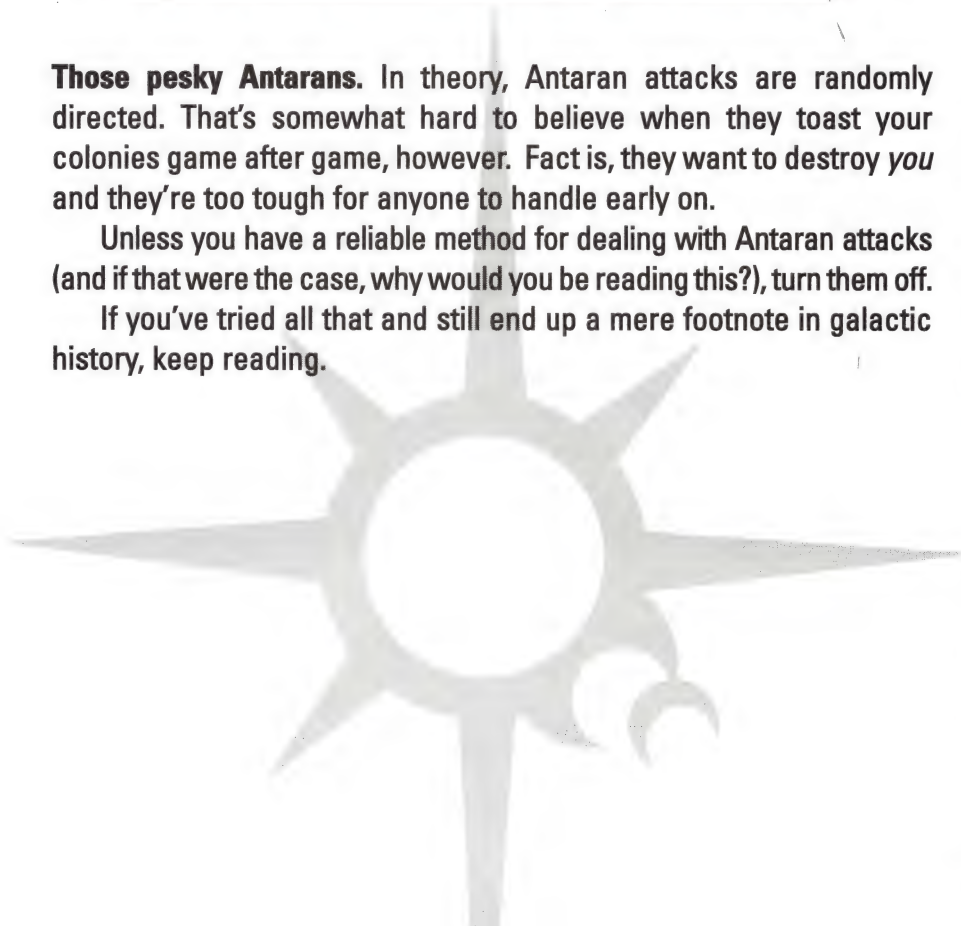
Another good option, of course, is to leave the events turned on and play a Lucky race. That way, you avoid the disasters and benefit from more than your fair share of the good random events. That seems only fair after what you've been through.



Those pesky Antarans. In theory, Antaran attacks are randomly directed. That's somewhat hard to believe when they toast your colonies game after game, however. Fact is, they want to destroy *you* and they're too tough for anyone to handle early on.

Unless you have a reliable method for dealing with Antaran attacks (and if that were the case, why would you be reading this?), turn them off.

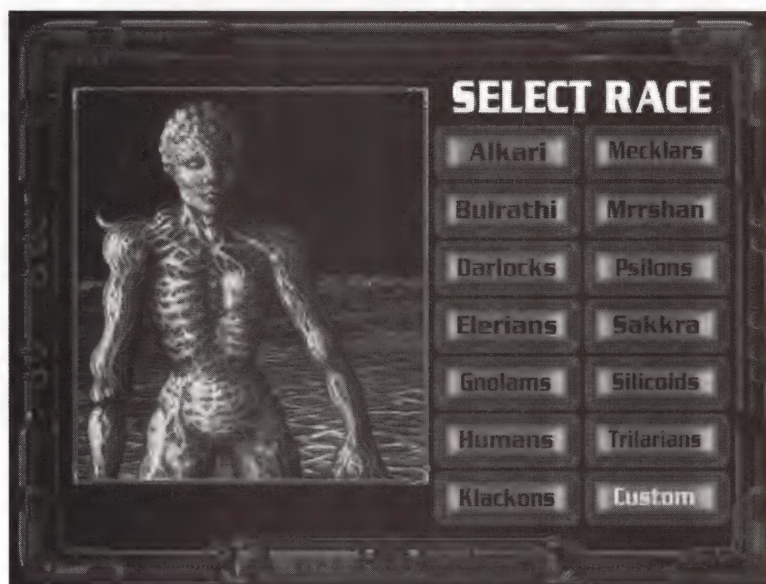
If you've tried all that and still end up a mere footnote in galactic history, keep reading.



WINNING RACES

Every race in the game has weaknesses. No matter which one you play, some negative characteristic is just waiting to sneak up and bite you. Lack of early success may stem not from your inexperience as a leader, but from your population's innate limits. Although there's no such thing as a perfect species, you should pick one whose strengths balance out any recurring problems you've had and whose weaknesses you can compensate for.

In Chapter 3 we examine all the races in detail—including how to build a successful custom race—so we won't spend too much time on them here. A few tips should help you survive the early game.



THE RACE SELECTION SCREEN

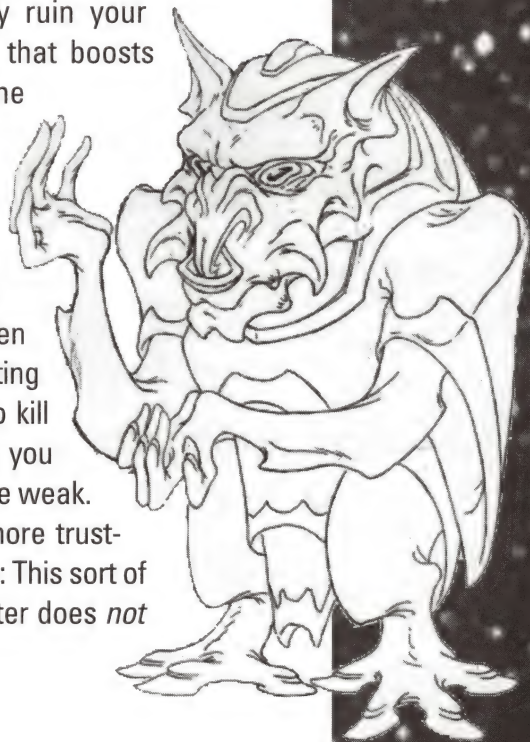
Be Omniscient. Let's face it. This is the best racial characteristic you can have during the early game. (It's not so bad later, either!) With Omniscience, you already know everything there is to know about every system—planetary characteristics, system specials, the location of space monsters—everything. This means you never need to build or send out scout ships.

Where you place your colonies is crucial, and Omniscience provides all the information you need to pick the best planets without ever leaving your home world. As soon as any opponent builds a ship, you know about it. If anything—other races, wandering space monsters, Antaran fleets—targets one of your colonies, you learn about it right away and can take precautions. What's not to like?

Be Lucky. If you can't be all-knowing, at least get chance on your side. Lucky races avoid all disasters, including rampaging space monsters, and enjoy most of the good effects of Random Events. A badly timed disaster early on can completely ruin your empire. On the other hand, finding a Derelict that boosts your technology could swing the whole game drastically in your favor.

Charisma prevents wars. If your biggest problem so far has been aggressive, computer-controlled neighbors, try charming them out of their socks. Novice players bent on conquering the galaxy often overlook the power they can gain by cooperating with other empires. Remember, you don't have to kill everybody right away. Take your time, get what you can from them, then attack when you know they're weak.

Of course, the other empires are really no more trustworthy than you are, so keep your guard up. (Note: This sort of charisma has no effect on opponents the computer does *not* control.)



Be Creative and stay ahead. We can't overemphasize the importance of research and technologies in this game. Your neighbor's Heavy Mount, Continuous Fusion Beams will go through your Class I shields like so much tissue paper. Without the farming technologies, you would be forced to fight a long war against starvation and ignore other important aspects of your empire. Although research becomes more of a factor as the turns wear on, the Creative characteristic and researching pluses can be essential. Be careful, though; the Creative characteristic is great but expensive, and you'll probably have to take a penalty to afford it.

Find a good home. Most races evolved on a home world that suits them perfectly (or, rather, they evolved to be suited for *it*). Still, in game terms some made out better than others. Early on, a large home world, one rich in minerals, or a planet with ancient artifacts can make the difference between a successful empire and a merely mediocre one. The more folks you can crowd into your first colony and the more raw materials they have available, the faster and earlier you'll be able to build the things you need to keep this colony afloat and establish new ones. The research boost from the artifacts doesn't hurt, either.

That takes care of the general advice. If you're experiencing a more specific problem—slow production, starvation, or whatever—look for a race whose characteristics specifically help prevent that recurring difficulty. When choosing a race, however, keep in mind that balanced production is essential. If the only way to get a money bonus is to take a minus in food production, make sure your strategy compensates for the decrease. Otherwise, you just trade one problem for another.

If you have money troubles, choose a race with a plus for money or the Fantastic Traders characteristic.

- If you can't keep your population fed, pick a race with a food plus, a Cybernetic race, or Lithovores.
- Not enough citizens? Some races have pluses for population growth. If you run out of room too quickly, try a Subterranean race; they can fit twice as many bodies on the same planet. A Large home world helps, too.
- Can't seem to build anything? Production pluses are available. Also, production of all types (food, research, building) is especially good for races who are always content—Unification government.
- If you seem to be completely incapable of winning a battle, try a race with Warlord ability or ship-to-ship combat pluses.
- Science progresses much too slowly? There are research pluses. Also, any of the other production bonuses frees up more of your population to work on science. Consider espionage (if contact with others isn't your problem) and conquest (assuming you don't have trouble in that area) as technology sources.



Finally, familiarize yourself with the benefits and banes of the type of government you've been playing with. Anything that affects morale affects *every type of production*—food, money, and construction.

COLONY BASICS

PLANET	CLIMATE	GRAVITY	MINERALS	SIZE
Diab	Terran (Food)	Low (2.0g)	Poor (2000000000)	Small (1000000000)
Tauri III	Grid (Food)	Normal (1.0g)	Abundant (3000000000)	Huge (10000000000)
Bafoc	Swamp (Food)	Normal (1.0g)	Off-Sea Rich (3000000000)	Small (1000000000)
Diab II	Ocean (Food)	Normal (1.0g)	Abundant (3000000000)	Large (1000000000)
Shashbala	Ocean (Food)	Normal (1.0g)	Poor (2000000000)	Medium (1000000000)
Gane Ba	Tundra (Food)	Heavy (4.0g)	Rich (3000000000)	Huge (10000000000)
Tauri IV	Tundra (Food)	Low (0.5g)	Poor (2000000000)	Small (1000000000)
Tau Cygni II	Desert (Food)	Heavy (3.0g)	Rich (3000000000)	Large (1000000000)

Turn to Diab

SORT PRIORITY

Climate Minerals Size

DISPLAY RESTRICTIONS

No Enemy Presence

Normal Gravity

Non-Hostile Environment

Mineral Abundance

Planets In Range

SEARCH COLONY SHIP

Return

If you don't run your colonies well, you don't have a chance in this crazy galaxy. No matter what, if you manage your worlds badly, your empire is doomed. Experienced *Civilization* players have a distinct advantage here. The colony management concepts in *Master of Orion II* resemble Civ's city management essentials. For the most part, Civ city strategies work well in your MOO II colonies—as long as you remain conscious of the differences.

Naturally, the care and feeding of your colonies is a complex topic, and we cover it at length in a later chapter. To get you over any problems in the early turns, we offer a few general pointers here.

Choose planets wisely. Why build a colony on the first uncolonized world you come across? Shop around. The world best suited to you depends somewhat on the race you're playing, but it almost certainly won't be the first one you find. Remember, you're going to be stuck on that planet for the rest of the game (hopefully). If it's a dud, the colony you build there will suffer from intrinsic problems—and drag your empire down with it. Every world has drawbacks, but some have fewer than others. Try to stay away from Radiated and Toxic, Low-G and High-G, Tiny and Small, Ultra Poor and Poor. If your race is Omniscient, selecting a planet becomes much easier.

Provide food for everyone. Sounds simple, right? It's not. Though it's less of a problem for Lithovores and Cybernetic races, as the population goes up, so does its demand for whatever it eats. Some planets produce no food at all. You can't do anything about mineral abundance (relevant for the aforementioned Cybernetics), but you *can* increase your colonies' food-producing capability. Do so. The goal is to provide as much food as possible per population unit. Then, assign exactly as many farmers as you need to feed everyone—and free everyone else to build or do research!



A small food surplus is good; as your population grows, it will take up the extra. Creating too great a surplus wastes potential production, however. An overall harvest of between +2 and +5 food is usually adequate. Another thing: Build some freighters before you establish multiple colonies. Freighters allow you to specialize, using the planets with the best farming to provide food for everyone, while the rest do those all-important other things.

Watch your money. Income comes from the sale of excess food (1 BC per 2 extra per turn), production of Trade Goods, and from general taxation. Once you've collected lots of BCs, you can buy items to speed up production. The trouble comes *after* you build something. Almost everything you can produce has a built-in maintenance cost. These costs mount rapidly—especially if you complete several building projects simultaneously—and they can easily overwhelm you if you're not careful.

Now, you might think, "So what?" If you're not in a hurry to build things, you might decide that the treasury doesn't matter and let it dwindle. Bad move. You're not allowed to go into debt, and the game isn't choosy about what it sells off to make up for a deficit in your treasury. If your farming improvements (for example) or Freighter Fleets get sold off, you could be in deep Bulrathi dung. Plain advice: Don't overbuild unless you have a large, stable income.

Keep the people content. Unhappy people aren't very efficient workers. Soon after you establish any colony, build a Marine Barracks there (unless you're playing a Unification government). A little later, consider another happiness-inducing structure. Unhappy populations never revolt, and the game won't go out of its way to tell you your people are bitterly miserable, but all your production efforts quietly suffer. It doesn't cost much to keep your subjects content, and the rewards are well worth it.

Strike a balance. Farming, manufacturing, income, and research all spring from the same source—your colonies' population. Unless you're temporarily pushing toward a specific goal, unbalanced production serves no purpose. Steady, modest growth—for your empire as a whole—is a surprisingly effective economic strategy.

This doesn't mean you should assign the same amount of population to each task or that colonies shouldn't specialize when possible. Rather, assign what's necessary to food (as we suggested earlier), temper your production efforts to realistic levels (keeping maintenance costs in mind), and throw all your extra population units into research. When you build, use the same philosophy. Having lots of defensive and research bonuses from buildings is a great thing, but if you forget to build the Spaceport, you'll run out of money.

Defend your planets. Invasions are easy when there's nothing in a system but helpless colonies. This isn't a problem early in Pre-Warp games (because no one has enough ships to carry on a serious war), but invasions will happen, and you should prepare for them. Ships are your best defensive bet for a star with multiple colonies, because a fleet protects the system as a whole. If you have only one colony orbiting a particular star, then a Star Base or Missile Base can be just as good for warding off less powerful fleets. Don't go overboard, though, or maintenance costs become onerous.

Marines (or Armor, a little later) come in handy if the enemy decides against just bombing you out of existence, but really aggressive opponents always keep a Colony Ship waiting in a nearby system. Marines also keep people happy, of course, and they're useful against your less barbaric enemies.



Tip

Why build a Marine Barracks

first, instead of some other morale-enhancing structure? For the same reason as you do in *Civilization*—it's the only happiness producer with a positive secondary effect. Marine Barracks squelch unrest and contribute to the colony's ground defenses. When you can get two for one in a game like this, you should go for it.

OTHER STUFF

That pretty much covers the essentials. The rest of this chapter provides a few general tips to help you survive your first hundred turns. If some seem obvious to you, good; you've got at least some instinct for this game. It's the tips you hadn't thought of that have the most value.



PICK A PLANET.

Don't send a Colony Ship to an unexplored system. What, are you crazy? Unless you're playing an Omniscient race (in which case you already know what's waiting), you should *always* send at least one scout ship in first, just in case there's a space monster or an enemy colony already there. You don't want to lose that expensive ship full of colonists.

Also, many stars have no planets at all, or have uninhabitable or nearly worthless ones. Don't waste your Colony Ships' time. You want them establishing colonies, not touring gas giants and Tiny, Ultra Poor, Radiated worlds.

Don't send two Colony Ships to the same system. Unless you're using the first ship to establish a colony for the second ship to leapfrog out to another system, sending two to the same star is pointless. To settle multiple worlds in the same system, use the less expensive Colony Bases, unless you're in a real hurry and don't mind the waste.

Do lots of research. As we said earlier, it would be tough to overvalue research in this game. A technology advantage vastly improves your chances of surviving (and maybe even winning). Don't neglect other things (like food and defense), but the more science you do, the better.

Don't spread out too fast. The more colonies you have, the better off you are, but you must be able to support and defend your gains. Allow your imperial infrastructure—especially freighters, defensive fleets, and food supply—to keep up with the expansion of your territory. Make sure the colonies you already have are fairly stable and easy to manage before you burden yourself with several more. When you establish a new colony, it helps to be able to buy the first few improvements outright. That requires a strong treasury.

Don't grow too slowly. Staying put in one system and making an impregnable fortress out of it is an attractive idea, but it's also suicidal. Doing this severely limits your empire's available resources. Plus, one strong invasion fleet could wipe out your race. Historically, empires have always felt pressure to grow, and it wasn't always because the leaders were greedy or insane.

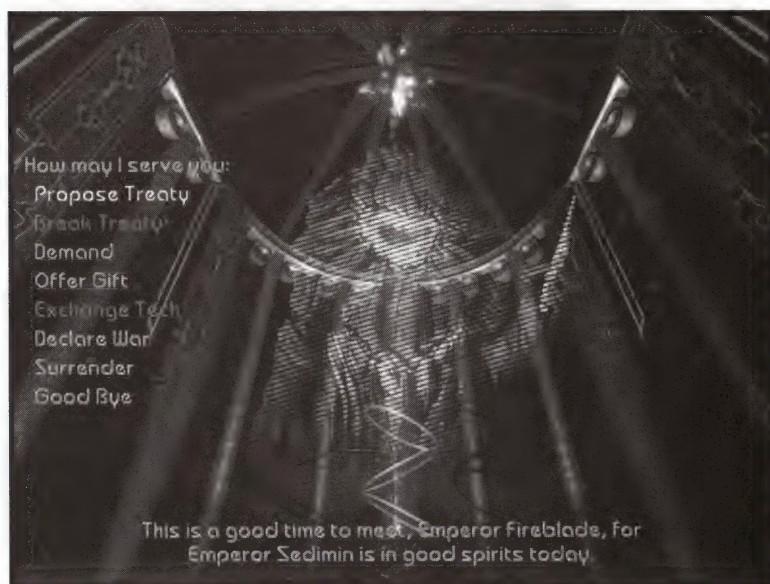
Watch the wormholes. Enemy ships can cross these things just as easily as yours can. If there's a wormhole near one of your colony systems, consider planting a defensive fleet or military outpost at one or both ends of it.

Use military outposts. Military outposts are cheaper to establish than colonies and require no management. True, they also don't produce anything, but they do have their uses. Obviously, they increase your range of exploration. An outpost is as good as a colony for range purposes, with one exception: Outposts are more easily destroyed. This is only a problem if you're near another race, but keep in mind that any of your ships caught out of range when an outpost or colony is destroyed automatically retreat.

Outposts also provide an early warning system; they detect incoming fleets as well as any colony. Note that, unlike a colony, you *can* build an outpost on a gas giant planet or in an asteroid belt.

Negotiate sometimes. When other races come to call, blunt hostility isn't always your best strategy. Unless your long-term intention is to go out after the Antarans, you eventually want to subjugate all the other races, but you should choose the right time for war.

Sun Tzu advised that you should never enter into a battle unless you're certain of easy victory. In this game, that means first taking the time to wear the enemy down—and to get what technology you can from them. Of course, if you discover a race that's vastly inferior to you early on, by all means don't give them a chance to change the odds. Conquer them right away.



ILL. 2-7. NEGOTIATION SCREEN

Design your ships. The default designs that the game comes up with (especially in Pre-Warp games) aren't particularly creative. You know what you want each class of ship to do, so design them to be as effective as possible in that role. For advice on this process, see the chapter on ship design.

Don't waste ships fighting the Antarians. Early in the game, you have no chance at all against even the smallest, weakest-looking Antaran fleet. Don't even try to fight. Have all your ships retreat as quickly as possible when they show up. If you have any advance warning, evacuate the system, sell anything you've built there, abandon your colonies, and head for the hills. Antaran attacks target a single star system, wipe out everything in it, and then the ships just go back where they came from. Once they're gone, you can go back and reestablish your colonies.



Tip

Sometimes the Antarians target a

system because they mistake one of your military outposts for a colony. Sometimes they go after one of your fleets, instead. Use this to your advantage. If Antaran attacks become a problem, establish a few outposts and leave a fleet or two in uncolonized systems. This way, you might redirect some of their violence.

The catch is this: If you lure the Antarians to an empty system (where there's not even an outpost to destroy and your fleet has left without engaging in combat), they stay there. Waiting, like a space monster, they'll destroy whatever enters that system for the rest of the game—or until someone defeats them.

ON TO GREATNESS . . .

Getting wiped out early is no fun, but keep all this in mind and it will happen less often. When you can successfully survive the first hundred turns or so, you're ready to conquer the entire galaxy. We've dedicated the rest of this strategy guide to making you the best emperor you can be, explaining how your computer opponents think and act, guiding your research efforts, and providing peeks backstage at the secrets behind *Master of Orion II*.



ILL. 2-8. CHEATED FOR ALL TECHS PROMPT

We'll even tell you how to cheat—if you're so inclined.



CHAPTER 3

SPECIES



AS IN THE ORIGINAL *MASTER OF ORION*, the species you choose has a great impact on the strategies and tactics you must employ throughout the game. The strengths and weaknesses of your race and your opponents' races affect every aspect of your game. Therefore, the best strategy when it comes to species characteristics is to learn what makes them tick. That's what the first part of this chapter is all about.

The rest of the chapter deals with another brand-new feature found in MOO II—custom races. We'll examine the individual characteristics and the point system used to build a race. By the time we're done, you should be able to analyze the merits and pitfalls of each racial advantage, disadvantage, and special ability based on their point values and, using this information, build effective, game-winning races of your own.

THE PREGENERATED

SPECIES

When choosing a race in *Master of Orion*, one had to rely on a rather vague description that told you very little. A major improvement in *Master of Orion II* over the original game is that all the traits and characteristics comprising each race's basic abilities are clearly defined and available for easy examination.

This section looks at each of the pregenerated species in detail. Listed for each race are advantages, disadvantages, and special abilities native to each. Table 3-1 provides this information "at a glance." (Attributes and Special Abilities are explained in detail later in this chapter, in the section titled "Custom Species.")

Table 3-1. Attributes and Special Abilities of the Pregenerated Races

Race	Population	Farming (Food)	Industry (Production)	Science (Research)	Money	Ship Defense
Alkari	—	—	—	—	—	+40
Bulrathi	—	—	—	—	—	—
Darlocks	—	—	—	—	—	—
Elerians	—	—	—	—	—	+20
Gnolams	—	—	—	—	+1.0 BC	—
Humans	—	—	—	—	—	—
Klakons	—	+1	+1	—	—	—
Meklars	—	—	+2	—	—	—
Mrrshan	—	—	—	—	—	—
Psilons	—	—	—	+2	—	-10
Sakkra	+100 percent	+1	—	—	—	—
Silicoids	-50 percent	—	—	—	—	—
Trilarians	—	—	—	—	—	—

Ship Attack	Ground Combat	Spying	Government Type	Special Abilities
—	—	—	Dictatorship	Artifacts; Home World
+20	+10	—	Dictatorship	High-G World
—	—	+20	Dictatorship	Stealthy Ships
+20	—	—	Feudal	Telepathic; Omniscient
—	-10	—	Dictatorship	Fantastic Traders; Lucky; Low-G
—	—	—	Democracy	Charismatic
—	—	—	Unification	Uncreative
—	—	—	Dictatorship	Cybernetic
+50	—	—	Dictatorship	Rich Home World; Warlord
—	-10	—	Dictatorship	Creative; Low-G World; Artifacts; Home World
—	+10	-10	Feudal	Subterranean; Large Home World
—	—	—	Dictatorship	Lithovore; Repulsive; Tolerant
—	—	—	Dictatorship	Aquatic; Transdimensional

In addition to their normal abilities and characteristics, each species also possesses two unique, intangible attitudes and behaviors we'll call "AI Traits." These characteristics don't affect you when you are controlling the race; rather, they manifest in the race's behavior when controlled by the computer. Personality is derived from a random roll between 1 and 10. The difficulty level of the game adds to the result. (Tutor = 0, Impossible = 4, and so on.) Any result over 10 is considered a 10. The personality is assigned as listed in Table 3-2.

Table 3-2. AI Traits

Race	Xenophobic	Ruthless	Aggressive	Erratic	Honorable	Pacifist
Alkari	—	—	—	1	2-8	9-10
Bulrathi	—	1	2-8	9-10	—	—
Darlock	1	2-3	4-10	—	—	—
Elerian	1-2	3-7	8-10	—	—	—
Gnolam	—	1-2	3-4	5-7	—	8-10
Human	—	—	—	1	2-8	9-10
Klackon	1-7	8	9-10	—	—	—
Meklar	1	2-3	4-10	—	—	—
Mrrshan	1	2-8	9-10	—	—	—
Pylon	—	—	—	1-2	3	4-10
Sakkra	—	1	2-8	9-10	—	—
Silicoid	1-7	—	8-9	10	—	—
Trilarian	—	—	—	1	2-6	7-10

The two AI Traits are:

- **Personality:** Each species has a certain, fundamental philosophy when it comes to the way they govern their people. This trait is one of the most telling factors when trying to predict a race's trustworthiness in negotiations and treaty situations.
- **Objective:** When under the control of the computer, each species works toward a specific game goal, ranging from peaceful coexistence to militaristic domination. This trait lets you know what to expect when a race starts expanding toward your star systems. (Objectives are determined at random, but they're heavily influenced by the race's attributes.)

THE ALKARI



Note

In the original

Master of Orion, every race had a number of other strengths, weaknesses, and traits. These included lines of research that were easier or harder for them to grasp, other game races that were automatically treated as enemies, and other races that were automatically treated as allies. All of these factors have been removed from MOO II.

Government Type: Dictatorship

Attributes and Special Abilities:

+40 percent Ship Defense, Ancient Home World

Those familiar with the bird-like Alkari from the original *Master of Orion* know they're formidable when it comes to space combat. Unless their opponents possess a Ship Attack bonus, the Alkari's defensive capabilities make them very hard to hit.

In addition to their defensive prowess, the Alkari have been updated to include the Ancient Home World Special Ability. This raises them above their former military-centered standing and makes them a more well-rounded species. This combination of military and scientific advantages makes the Alkari a good choice if you want to play a defensive game that concentrates on research.

THE BULRATHI



Government Type: Dictatorship

Attributes and Special Abilities:

+10 percent Ground Combat, High-G Home World

The solid, bear-like Bulrathi have the lock on ground combat. On top of their 10 percent advantage, Bulrathi ground troops have the boon of being able to withstand one full extra hit in combat. No other pre-generated race in the game can defend their colonies more effectively. They can also operate normally on both normal- and high-G planets.

As pregenerated races go, the Bulrathi are a little one-sided. Even though this species is average in the areas of research and space combat, you might find that you frequently fall behind your opponents in these areas. The Bulrathi are best utilized by experienced players with a thirst for annexing colonies and capturing enemy ships.

THE DARLOCKS



Government Type: Dictatorship

Attributes and Special Abilities:
+20 percent Spying, Stealthy Ships

It's hard to fight an opponent who can change form at will. In areas requiring stealth, the Darlocks are second to none. In fact, all the Darlocks' Attributes and Special Abilities revolve around their ability to remain hidden.

If you'd like to try your hand at espionage, the Darlocks are the race you should choose. Their spying bonus is formidable, making Darlock spies a real nuisance to their opponents. Unfortunately, like the Bulrathi, the Darlocks are a specialized race who are average in every other area of endeavor. Those unprepared to play a game that centers on a particular strategic theme—spying, in this case—should choose a more well-rounded species.



Note

The Darlock Spying advantage is their best quality. If their opponents are Omniscient, the Darlock's Stealthy Ships bonus is worthless.

THE ELERIANS



Government Type: Feudal

Attributes and Special Abilities:

+20 percent Ship Defense, +20 percent Ship Attack, Telepathic, Omniscient

The Elerians are new in MOO II. This strange and mystical race has a wide variety of advantages, ranging from bonuses in Ship Attack and Defense to heightened mental powers that tend to keep them one step ahead of their opponents.

This race is one of the better choices for new players. Omniscience is one of the best Special Abilities in the game; there's no better way to mount a defense than to know an attack is on its way far in advance. Elerian space fleets are also quite formidable, and can give most races a run for their money in the space combat arena. Finally, the Elerians' telepathic abilities give them an upper hand in diplomacy, espionage, and colony assimilation. The only downside is their primitive, feudal system of government.

THE GNOLAMS



Government Type: Dictatorship

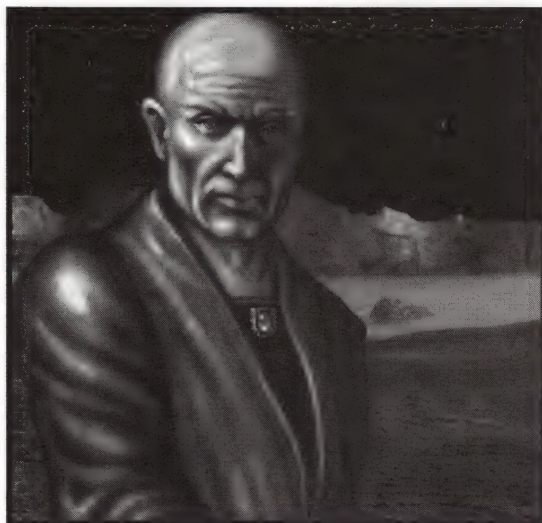
Attributes and Special Abilities:

Money = +1 BC, Fantastic Traders, Lucky, -10 percent Ground Combat, Low-G

Also new to MOO II are the Gnomams. These dwarf-like people have built their society around the acquisition of money, an area in which no other race can even come close. They also possess a tremendous lucky streak, and frequently reap the benefits of unexpected and profitable random events.

The Gnomams are another race built around a central theme. As such, they might be difficult for new players to handle. Money isn't everything, especially in this game. Although Gnomams usually have little trouble paying their maintenance and upkeep costs, they suffer greatly in both industrial and food production on normal- and high-G worlds. This narrows the choices for suitable colonies, and significantly inhibits the growth of a Gnomam empire. This race is better left to those who have gained some mastery over the game.

THE HUMANS



Note

**Multiplayer
Tip:** When
the computer

isn't controlling your opponents, the political advantage of being Human is all but lost. The 50 percent negotiating advantage gained from being Charismatic can't be enforced against live opponents. Don't choose to be Human when playing multiplayer games.

Government Type: Democracy

Attributes and Special Abilities: Charismatic

Diplomacy is the name of the game when you're Human. Humans are the only pregenerated race with a Democratic government, giving them an advantage in the areas of morale and colonist assimilation, and their Charismatic nature allows them to make friends easily in the political arena.

Whether or not to be Human is a judgment call for new players. Like many of the game's other pregenerated races, Humans are designed around a central theme—excelling in one area while remaining average in all others. The Humans' advantage over other specialized races is that their area of expertise allows them to make friends with *everybody*. If you can maintain the upper hand in the political arena, you can often keep all your opponents charmed and at arm's length until you've amassed huge invasion fleets that can quickly conquer the galaxy. If you're willing to play the political waiting game, Humans are suitable for players of any ability level.

THE KLACKONS



Government Type: Unification

Attributes and Special Abilities:
+1 Food, +1 Production, Uncreative

The insectoid Klackons are as uncreative in the scientific arena as the Psilons are creative. Klackons suffer greatly from this. However, their hive-like culture is well-suited to both food and industrial production.

The Klackons are another judgment call when it comes to their new-player suitability. Their production bonuses, as well as the bonuses they incur as a result of their Unification government, make their colonies quite prolific and their citizens constantly content. This *almost* offsets the Klackons' research ineptitude. If you manage to remain isolated from your opponents for an extended period of time, you can build an extremely formidable empire very quickly. Just be prepared to fight when you make contact; success doesn't come easy to an Uncreative species.

THE MEKLARS



Government Type: Dictatorship

Attributes and Special Abilities:
+2 Production, Cybernetic

The cybernetic Meklars excel in the area of industrial production; they have to. Their cybernetic nature requires them to “consume” a half-point of industrial production each turn. Without their production bonus, the Meklars’ industry would be quite strained.

Despite the fact that Meklars “eat” part of their production base, they tend to produce everything more quickly than anyone in the game. They also have a slight advantage in the research department, because some of the people normally needed for farming can be transferred to research tasks. The Meklars are a fairly good choice as pregenerated races go, no matter what your level of ability.

THE MRRSHAN



Government Type: Dictatorship

Attributes and Special Abilities:

+50 percent Ship Attack, Rich Home World, Warlord

The cat-like Mrrshan are no pussycats when it comes to war. Not only do they possess the maximum possible Ship Attack bonus, they also live by a strict code of behavior that trains all species members as expert warriors.

You have few strategic options when playing the Mrrshans: You must attack early and often, making the most of your warlike nature. Mrrshans tend to be one of the most formidable races in a military sense. Because the Mrrshan home world is rich, it allows good, early production, which helps in warfare and other areas. It's very important to spend your money and resources wisely when playing the Mrrshans. Concentrate on quick conquest rather than widespread colonization. Because of their military extremism, the Mrrshans are not recommended if you're new to the game. The last thing you need when you're learning the game is a situation that forces you into hostile relations with your opponents.

THE PSILONS



Government Type: Dictatorship

Attributes and Special Abilities:

+2 Research, -10 Ship Defense, -10 Ground Combat, Creative, Low-G, Ancient Home World

What the Mrrshans are to warfare, the Psilons are to science. No other pregenerated race in the game can outresearch them. In addition to their research bonus, the Psilons possess the coveted Creative Special Ability, which gives them *all* applications of each technology they research (as opposed to the normal one application for most technologies).

Your emphasis when playing the Psilons is obvious: Research like it's going out of style. If you're left unmolested by your opponents, you'll quickly outdistance them in the technology race. Because of their military weaknesses, the Psilons work best in a big universe, where they can keep to themselves for a long time. If you continue your research efforts unabated, your military technology will soon be so far ahead of your opponents' that your combat penalties will be irrelevant. This also gives you a mighty diplomatic club to wield; everyone wants to trade technologies with you, and they'll gladly make peace to do so. Play within these parameters, and the Psilons will work for you regardless of your ability level.

THE SAKKRAS



Government Type: Feudal

Attributes and Special Abilities:

**+100 percent Population, Subterranean,
Large Home World, + 1 Food, +10 Ground
Combat, -10 Spying**

Population, and lots of it—that's what the lizard-like Sakkras are all about. They multiply twice as fast as the average species and, what's more, their Subterranean attribute provides them with adequate living space for one and all.

All Sakkra traits point toward rapid growth. The combination of their Subterranean nature and their large home world make their home colony the fastest-growing in the game. They have huge populations and an innate ability to defend their colonies from attack. Because of their rapid growth rate, Sakkra colonies tend to be quite productive. Despite this seeming one-sidedness, the Sakkra are one of the better pregenerated species, no matter what your skill level.

THE SILICIDS



Note

**Multiplayer
Note:** Just as
the Humans

lose effectiveness in a multiplayer game, the Silicoids gain effectiveness. The negotiation penalty incurred as a result of being Repulsive can't be enforced against a live opponent.



Government Type: Dictatorship

Attributes and Special Abilities:

-50 percent Population, Lithovore, Repulsive, Tolerant

A problem frequently faced by most species—feeding the population—is no problem for the Silicoids. This species of Lithovores dines on the local rocks and minerals, requiring no farming support whatsoever. They can also operate in any environment, thus squeezing a greater population onto any size planet. Unfortunately, they lack both population growth and diplomatic aptitude.

Despite the fact that they need no food and that they make efficient use of any planetary environment, the Silicoids have many strikes against them. Their slow population growth hampers their growth throughout the game. As if stunted population growth weren't enough, the Repulsive Silicoids quickly fall behind in the diplomacy department as well. Of all the game's pregenerated races, the Silicoids are by far the most difficult to play.

THE TRILARIANS



Government Type: Dictatorship

Attributes and Special Abilities:
Aquatic, Transdimensional

The Trilarians, the third new race in MOO II, have two rather diverse advantages. First, because they are Aquatic, the Trilarians have a higher potential population and higher food production on ocean and swamp worlds. They also possess the ability to bend space, so their space fleets travel much faster.

Because their abilities are rather diverse, the Trilarians are more flexible than many of the other pregenerated races. Ocean and swamp planets make up only a small percentage of the worlds you encounter, so the Aquatic ability is not tremendously impressive. Their Transdimensional ability, on the other hand, is impressive indeed. This gives the Trilarians a particular advantage in a prewarp game, because they'll be able to travel great distances significantly faster than their opponents. Although they're not as overwhelmingly impressive as some of the other species, the Trilarians can work for players of all ability levels.

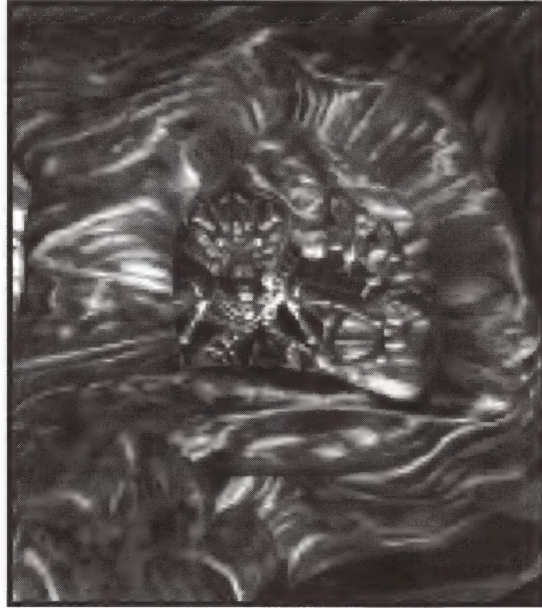


Note

Multiplayer Tip: In a multiplayer

game, you're much better off generating a custom species than using a pre-generated one. Everyone knows the abilities of the game's thirteen races. The only way to keep them guessing is to come up with a completely new and unique race. You might even want to use the other players' familiarity with pregenerated species to your advantage by naming your custom race after the pre-generated race whose image you've chosen. The section "Custom Species" later in this chapter provides details.

THE ANTARANS



The Antarans are a race of beings from another dimension who are absolutely bent on destroying all intelligent life in the galaxy. They can't be reasoned with, and they're extremely xenophobic. Once they get started, they attack relentlessly until they've exterminated all races in the galaxy. The Antarans are always computer controlled. Sorry. You can't play as them.

When the game begins, the Antarans enjoy a level of technology vastly superior to that of the galaxy's other races. Their technology doesn't change as the game goes on, however, so you should gradually close the distance. Unfortunately, you can't research Antaran technologies. They're not in the research tree anywhere. The only way to get their stuff—and it's extremely useful stuff, too—is by capture.

Once these interdimensional exterminators discover the means to cross the dimensional boundary, they begin attacking targets within the galaxy. Their dimensional portals deposit them in random locations. Thus, they can show up anywhere, though they usually give you plenty of warning. The Antarans have only one star system in their dimension, so the invasion fleet is usually small. However, their superior technology gives them a decisive advantage in combat. When an Antaran fleet phases into your dimension, it immediately selects a target system. Nothing can prevent or divert them from reaching that system. Once at the target, the Antarans attack, attempting to destroy one of the colonies or outposts in that system. Having vented their xenophobic rage, they disappear back into their dimension.

These guys are a big pain in the neck, but you can use them to your advantage.



Capturing Antaran Technology

In addition to the obvious strategy of gloating when the Antarans decimate one of your opponents' colonies, there's another good use for Antarans. You can take their technologies to use in your own ships. To do so, you must capture one or more Antaran ships. This is extremely difficult, but rewarding. Once you capture the ship, it becomes yours to use. Even late in the game, this gives you a *serious* advantage in space combat. Antaran ships are just as powerful under your control.



Note

When the Antarans destroy one

of your enemies' colonies, don't just gloat—take advantage of the situation. A perfectly good planet has just been sterilized and left empty for your use. By the time the other emperor gets over the shock and returns to recolonize the victimized system, you should already have a fleet there, a colony, or—the best situation of all—*both*.

The other alternative is to take the Antaran ship to a system in which you have a colony (an outpost won't do) and scrap it. Seems like a waste of a great ship, right? Wrong. Just like any other captured ship, a scrapped Antaran vessel gives you at least one piece of Antaran technology used in the construction of the vessel. After the guaranteed first technology, you have a 25 percent chance of getting each of the other ones. You can start installing these in the rest of your ships right away—no research necessary!

If there's a pressing opportunity to use the captured Antaran ship (you're in the middle of a nasty war, for example), your best strategy might be to use it in a few battles, just to turn the tide, *then* consider scrapping it. Just don't wait too long. Remember that other races can capture the ship away from you as easily as you took it from the Antarans. Then you'd lose the technologies, too.

Eliminating the Antarans

The only effective means of defeating the Antarans is to destroy their home world. When you can build a Dimensional Gate, you can go after them on their own turf. Don't send ships in until you've assembled a pretty tough fleet; the Antaran home world is not a place for sissies.

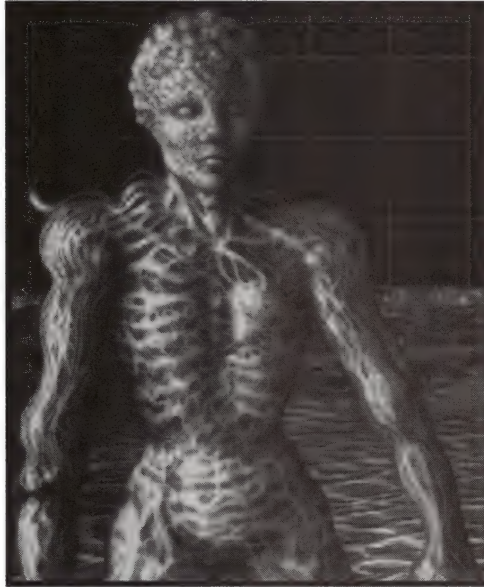
What, exactly, is waiting for you there? A big fight, that's what. That's why we cover the assault on Antares in Chapter 7, "Combat." Eliminating the Antaran menace causes all the game's computer-controlled empires to submit to your obvious superiority. That is, you win.



Note

The Antarans frequently destroy their own ships to avoid capture, so beware!

CUSTOM SPECIES



A feature that adds a lot of depth and replay value to MOO II is the ability to create customized races. With the wide variety of available Attributes and Special Abilities that can go into the design of a new race, custom race games almost never play the same way twice.

PICKS AND PERCENTAGES

Before we get into creating your custom race, it is important to understand the creation process. The number of Attributes and Special Abilities you can choose is limited by the number of "Picks" available. The number of Picks is listed at the bottom of the Race Customization screen (see Figure 3-1).

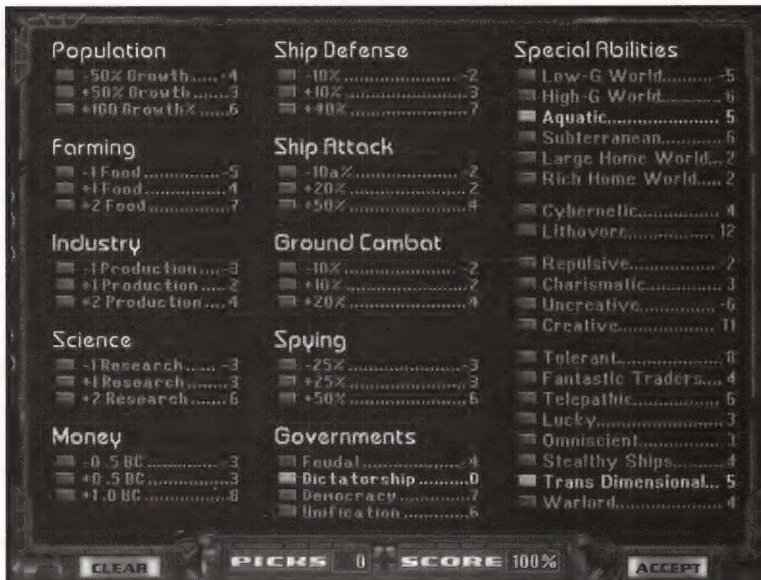


FIGURE 3-1. THE RACE CUSTOMIZATION SCREEN

You'll note that you have 0 Picks when you first get to this screen. That's because the Attributes and Special Abilities of the race whose picture you selected on the Race Selection screen carry over onto the Race Customization screen. If you click Accept at this point, you've effectively chosen to play the race whose image you chose. Therefore, the first thing you should do is click Clear. When you do so, you'll note that all the previously chosen characteristics "un-highlight," leaving you with a blank slate and 10 Picks.

The number of Picks you have determines the number of Attributes and Special Abilities you can choose. Each item on the Race Customization screen comes with a positive or negative point value. As you might suspect, items with a positive point value are advantages and negative items are disadvantages. As you add Attributes and Special Abilities to your custom species, the number of Picks available decreases (for each advantage chosen) and increases (for each disadvantage chosen). (The next section provides the Pick point value for each item on the list.) When all is said and done, the number of Picks remaining must be 0 or higher.



As you design your race, you'll notice another number at the bottom of the screen labeled "Score." As you select Attributes and Abilities, this number, expressed as a percentage, increases and decreases along with your picks. Score is a modifier to your overall game score. Every Pick remaining above 0 adds 10 percent to your score. In other words, if, upon completion, your custom race has 2 Picks remaining, the score would be 120 percent. Throughout the game, the number of points you accumulate is multiplied by this percentage. So, using the example above, your custom race would receive 120 points for every 100 accumulated in the game. By limiting your number of racial advantages, you can increase your game score dramatically. In fact, by choosing 10 Picks worth of disadvantages and *no* advantages, you increase your score modifier to a whopping 300 percent!

ATTRIBUTES AND SPECIAL ABILITIES

Creating custom races depends on an understanding of the advantages and disadvantages of each Attribute and Special Ability you can select. Once you have a basic knowledge of each, you can combine, mix, and match them to construct a truly effective custom species.

Attributes

The first two columns of the Race Customization screen list your race's basic Attribute categories. You can modify your race's Attributes in 10 areas, ranging from population growth rate to combat and espionage effectiveness. How you modify these areas affects many of the game's basic functions. Each Attribute has three possible modifiers (with the exception of Governments, which has four).



Note

You can't choose more than 10 points

worth of disadvantages, even if they are balanced by advantages.



Tip

The choice of whether or not to

increase your game score by heavily weighting your custom race with disadvantages is a purely personal one—it all depends on your goal. If accumulating points is your goal, building a heavily disadvantaged custom race is certainly a viable alternative. Just remember that you'll have to live with the consequences of your choices throughout the entire game. This makes the game much more difficult to win. For players who have the goal of conquering the galaxy or just plain surviving, the better alternative is to use disadvantages to balance out an equal number of advantages. If you must have a score advantage, try to limit it to 20 or 30 percent. This makes gameplay a little more even, and a lot more fun.



Note

When you select no Attribute

modifications, your race's performance in that field is considered to be "galactic normal," with no positive or negative modifiers. The only Attribute with a default setting is Governments, which defaults to Dictatorship (at a cost of 0 Picks).

Population

-50 percent Growth = -4 Picks

+50 percent Growth = 3 Picks

+100 percent Growth = 6 Picks

This Attribute affects how quickly your colonies grow. The Population modifier combines with any modifiers for climate and pollution on each colony world to determine the actual rate of population growth.

A healthy Population bonus can certainly be helpful early in the game. The more quickly your colonies grow, the more productive they become. You can also establish early colonies on worlds where, under normal conditions, you would have little or no population growth. Just remember that you can offset just about any planetary disadvantage by constructing colony buildings and improvements as your technology base grows. Also, once your colonies reach their maximum populations, growth bonuses become worthless. Normal population growth is usually sufficient, but if you feel you must improve your population growth, go with a maximum of +50 percent, and save your Picks for more important Attributes and Abilities.

Farming

-1 Food = -5

+1 Food = 4

+ 2 Food =7

Depending on planetary conditions, each farmer on most of your colonies can produce from one to three units of food every turn. After taking local conditions into account, any Farming bonus is added to determine the total number of food units each farmer produces. Even with a -1 Farming penalty, no farmer can produce less than one unit

of food per turn (except on planets that are incapable of producing food, in which case you can't assign any farmers, anyway).

Starvation can be one of your colonies' biggest problems early in the game. This makes the Farming bonuses pretty tempting. In addition, the added food generation allows you to assign more colonists to research and production. The +2 Food bonus is extremely expensive; if you plan to choose any other expensive Attributes or Abilities, you have to take some pretty hefty penalties to compensate. However, the +1 bonus is reasonable given the benefits it provides.

Industry

-1 Production = -3

+1 Production = 3

+2 Production = 4

The Industry bonus affects the speed at which colonies build things. Each colony member assigned to production normally generates one to eight units of production per turn, based on the mineral-richness of the colony world. The Industry bonus is added to the base number to determine the total units of production per turn each worker produces.

If your goal is to conquer the galaxy quickly, you can't ignore the value of the Industry bonus. The more units of production you can squeeze out each turn, the faster you can build a daunting space fleet. If you have enough Picks, an Industry bonus of +1 is almost always a good idea. The only time you should ever consider taking an Industry penalty is when you're playing against few opponents in a large galaxy.

Science

-1 Research = -3

+1 Research = 3

+2 Research = 6

The Science Attribute affects the speed at which your species is able to discover new technologies. Normally, each colonist assigned to perform scientific research generates 3 Research points per turn. The Science bonus or penalty is added to this to determine the total number of Research points each scientist produces per turn.

Scientific research is one of the game's most vital factors. Sure, you can spend all your Picks pumping up your production capabilities, but if you fall behind in research, all the production in the galaxy won't save you from the powerful, advanced weaponry and systems your opponents employ. Under no circumstances should you consider taking a Research penalty. On the contrary, you might want to make it a habit to set aside a few extra Picks to take at least a +1 in the Science Attribute. You'll be glad you did.

Money

-0.5 BC = -3

+0.5 BC = 3

+1.0 BC = 8

This Attribute might be a bit confusing to some. Money doesn't have an impact on your starting funds; rather, it affects the amount of tax money you collect from your empire's citizens. Normally, your colonies generate 1 BC per turn per unit of population. (You can raise taxes to boost this, of course, but only by sacrificing production.) The Money Attribute increases or decreases the amount of money you collect. For instance, if you take a +0.5 bonus in this Attribute, each unit of population pays 1.5 BC per turn rather than the normal 1 BC.

A bonus in the Money department might seem to be just the shot in the arm your race needs. However, there are better ways to bolster your economy, like increasing commerce and constructing money-producing buildings like Spaceports in all your colonies. If you have your heart set on a bonus in this Ability, you should stay away from the +1 BC bonus. It's tremendously expensive and requires quite a few penalties to balance out if you intend to add additional bonuses. For one Pick less, you could take both a +.5 bonus here *and* the Expert Traders Special Ability, a combination that could potentially be much more profitable.

Ship Defense

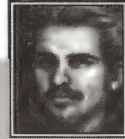
-10 percent = -2

+10 percent = 3

+40 percent = 7

Bonuses in the Ship Defense Attribute decrease the likelihood of enemy beam weapon fire hitting you during ship-to-ship combat, while a penalty increases your chances of being hit. (Remember, missiles and torpedoes *always* hit unless they're destroyed or misled.)

Whether you're militaristic or pacifistic, a bonus in this Attribute can be quite useful. If you expect to engage in combat frequently, take the 40 percent bonus and find some penalties in other categories to balance it out. If you can't afford the 7 Picks, you should at least consider the 10 percent bonus. Never take a penalty in Ship Defense unless you *know* your opponents *never* use beam weapons. Even when you have plenty of advanced shield research, the best defense is not to get hit!



Tip

Multiplayer

Tip: It's particularly

important to strongly consider a 40 percent bonus in Ship Defense when you play against other people rather than the computer. Only two of the 13 pregenerated races have bonuses in Ship Attack. Considering the low cost, multiplayer opponents who generate their own races are bound to choose the 50 percent Ship Attack bonus. When you're up against particularly aggressive people—and let's face it, most people don't join a multiplayer game to be nice to each other—you'll almost certainly be at an immediate disadvantage if you don't bolster your defenses.

Ship Attack

-10 percent = -2

+10 percent = 2

+50 percent = 4

Bonuses in this category increase your chances of hitting your opponents with beam weapons in ship-to-ship combat, while a penalty decreases your weapons' accuracy.

Like Ship Defense, you shouldn't take a penalty in the Ship Attack Attribute. In fact, considering the low cost of bonuses in this category, it is almost foolish for war-like players not to take the bonus. For a mere 4 Picks, you can increase your chance of hitting a target by 50 percent. Even if your opponent has the highest Ship Defense bonus available, you're still at a 10 percent advantage in combat. If you're a natural aggressor, this is one of the Attributes you want to concentrate on.

Ground Combat

-10 percent = -2

+10 percent = 2

+20 percent = 4

This Attribute increases or decreases the ability of both your ground troops in planetary battles and your Marines in ship boarding actions. Unlike the enhancements available for ship combat, the Ground Combat Attribute affects both attack and defense.

This is another Attribute that's tempting for aggressive players. Not only will a bonus in this category help you take over your opponents' colonies, enhanced Ground Combat will help you to capture enemy ships. This is a particularly impressive ability when it comes to capturing Antaran ships, which contain very powerful and useful technology available only by capture.

Spying

-25 percent = -3

+25 percent = 3

+50 percent = 6

Spying affects your spies' ability to infiltrate enemy worlds to steal technology, perform sabotage, and so on.

This Attribute's bonuses and penalties are strictly based on your style of play. Spying can be useful in MOO II, especially when it comes to stealing technology. In most research categories you want more than one technology, and the only way for a non-Creative race to get more than one is to beg, borrow, or steal it. (See Chapter 6 for details.) If you use a strategy that doesn't rely heavily on espionage, you might want to forget about bonuses in this Attribute—in fact, you might even try taking a penalty. It's possible to win the game without ever building a single spy.

Governments

Feudal = -4

Dictatorship = 0

Democracy = 7

Unification = 6

Your system of government determines your population's morale, your spying ability, and a number of other factors.

The Government Attribute is different from all the others. The default government type is Dictatorship, which costs 0 Picks. Unlike other strategy games, you don't have the opportunity to change your system of government during the course of the game, although each government type has a more advanced form that you can attain through research.



Note

Spies used to defend your colonies can also receive a bonus or penalty based on the type of government you choose.



Tip

The designers at SimTex must feel that

Dictatorship is the way to go, based on the game's pregenerated races —9 of the 13 use this system of government. Indeed, this is the most "middle-of-the-road" government system, and is pretty balanced between penalties and bonuses. Rather than following their lead, however, you should choose the government with the bonuses that most enhance your preferred style of play.

As with Spying, you should base your choice of government on the style of game you intend to play. Every system has advantages and disadvantages that you must weigh carefully before you commit yourself to a decision. For details on each government type, see the game manual.

Special Abilities

Whereas the Attributes define species' basics, Special Abilities are factors that make each race truly unique. Special Abilities are available to affect just about every aspect of a race's game performance.

Low-G World (-5 Picks)

This penalty indicates that your race's home world has particularly low gravity. This makes the species inherently weaker (physically), and thus imposes a -10 percent penalty in ground combat. In addition, production penalties are incurred on colonies with Normal- and High-G environments.

If you're prepared to take a penalty in your ground combat ability, choosing a Low-G World is definitely the way to go. It incurs the same penalty as choosing -10 percent in the Ground Combat Attribute, but it gives you three extra negative Picks. In other words, for the same penalty, you offset more bonus abilities. In fact, you can offset the Low-G World penalty by choosing +10 percent Ground Combat for 2 Picks, leaving you with a balance of -3 Picks. This is a great way to add a 3-Pick bonus without having to balance it with a penalty. Of course, this forces you to deal with the production penalties on all but Low-G worlds, but research eventually provides ways to compensate for this problem.

High-G World (6 Picks)

Beings from a High-G home world have a distinct advantage in ground combat, in that they can sustain more damage before they're killed. In addition, High-G species have no production penalties caused by the gravity level of Normal and High-G colony worlds.

The advantages of this Special Ability are obvious, but it's a bit pricey. In the long run, you're better off with a Normal (default) home world and a Ground Combat bonus. It's cheaper that way.

Ancient Home World (3 Picks)

Species native to an Ancient Home World start the game on a planet that was once home to a highly advanced species. As a result, the world is chock-full of ancient artifacts, making research efforts more lucrative: Each scientist on the home world produces +2 Research *every* turn.

Because research is a vital element of the game, anything that gives your race a head start in the Science department is very useful indeed. Playing a species with an Ancient home world gives you a great technological advantage early in the game. This is a particularly nice ability when you combine it with a Science Attribute bonus.

Aquatic (5 Picks)

Aquatic species ignore all the disadvantages other races' experience when colonizing Swamp and Ocean planets, and in fact incur significant food production and maximum population benefits in these environments.

The bonuses that result from being an Aquatic species are many. Unfortunately, they only apply to two climate types. If you happen to be placed in an area of the galaxy that has lots of Swamp and Ocean worlds, this Special Ability will get you far. Of course, there's no way to guarantee that this will be the case. For this reason, you can probably find a better place to spend 5 Picks.

Subterranean (6 Picks)

Because they have the ability to live beneath a planet's surface, Subterranean species can grow their colonies to double the maximum population in any planetary environment. They also receive a 10 percent bonus in ground combat when defending their colonies.

The Subterranean Special Ability is much more well-rounded than some of the others in the game. It makes it possible to build colonies that are both huge and difficult to conquer. This can be a distinct advantage well worth the high cost when you're up against a bunch of colony-snatchers.

Large Home World (2 Picks)

The home world of a race with the Large Home World Special Ability has a larger maximum population than normal, due to its size.

This Special Ability is worth considering. It can give you a distinct advantage early in the game, because more population means more potential food, production, and research. The reason it's so inexpensive, however, is that it applies only to your home world itself. Large home world can be particularly effective when combined with Rich home world (see below).

Rich Home World (2 Picks)

A species with a Rich home world is blessed with a home planet with particularly abundant mineral deposits.

A Rich home world means lots of production, pure and simple. Although this applies only to your home planet, the early advantage it provides can get you off to a quick start when building fleets for exploration or conquest. When combined with the Large Home World Special Ability, the fusion of huge population potential and high production potential can be a difficult early-game advantage for your opponents to overcome.

Cybernetic (4 Picks)

As part-biological, part-mechanical beings, Cybernetic species eat only half the food normally consumed by fully biological species. This is supplemented by consuming half a point of production per population unit per turn.

The fact that Cybernetic beings consume only half a unit of food per turn makes this a tempting Special Ability—until you take into account the effect on your production, which can be significantly diminished. If you choose this ability, you might want to take a bonus in the Industry Attribute to bolster your production capabilities. A +1 Industry bonus is enough to equalize the Food and Production bonuses (one-half point extra per population unit per turn).

Lithovore (10 Picks)

Species who are Lithovores have the distinct advantage of being able to consume a planet's native rock. In other words, they don't need *any* food.

How tempting is this? You can forget about farming altogether and concentrate your population on the important production and research tasks at hand. Well, that's an interesting notion, but at what cost? This Special Ability is one of the two most expensive in the game—expensive *and* impractical. If you're worried about food consumption, you're better off being Cybernetic.

Repulsive (-6 Picks)

Repulsive species have a very difficult time when it comes to diplomacy. Large penalties accrue in any diplomatic confrontation, and they have it tough assimilating conquered colonists into their population.



Tip

Multiplayer Tip: Don't worry about

the effects of being Repulsive when designing a species for a multiplayer game. Choosing Repulsive is like giving yourself six free Picks in a multiplayer environment, because other players handle the diplomacy, not the computer. The only consequence you'll face is slow assimilation of conquered colonists.



Tip

Multiplayer Tip: Charismatic

loses a great deal of its value in a multiplayer game. Its only benefit is that you can assimilate conquered colonists more quickly than normal. Therefore, save your Picks for something other than Charismatic in a multiplayer game.

The consequences of being Repulsive are huge—but that's why it's a -6 penalty! If you saddle yourself with this disadvantage, be prepared to fight. It's unlikely you'll be able to convince anyone of your good intentions. Unless you really need the extra Picks or don't intend to talk anyway, avoid this one.

Charismatic (3 Picks)

The diametric opposite of Repulsive species, Charismatic races are often automatically admired by their rivals. They receive considerable bonuses when it comes to diplomatic situations. In addition, conquered colonists are almost happy to be assimilated by them.

There aren't many Special Abilities more useful than Charismatic. Charismatic races can not only get warlike enemies to frequently agree to peace, they can also get away with some pretty underhanded things without suffering the normal consequences. Whether you're playing a military game or a diplomatic one, Charismatic is a well-spent 3 Picks.

Uncreative (-4 Picks)

Uncreative species are at a distinct, *serious* disadvantage in research.

Choosing Uncreative is a double-edged sword. You gain 4 Picks, but you risk falling far behind your opponents in research. If you opt for this rather daunting disadvantage, you must be prepared to bolster your Military and Spying Abilities, because you'll be much more dependent on stealing and capturing technologies from your opponents than you normally would. You should only choose this Special Ability if you're prepared to play aggressively.

Creative (8 Picks)

Creative species are scientifically gifted; they gain the knowledge and use of *every* application of a given field of research each time they discover one.

This is one of the finest Special Abilities, despite the huge price. Actually, considering what Creative does for your research effort, it's actually quite a *bargain* at a mere 8 Picks. Do yourself a favor and give this one a try. It takes most of the decision-making out of the research portion of the game, and no other race—unless they're also Creative—will be able to match you technologically.

Tolerant (10 Picks)

Tolerant species can readily adapt to any type of environment. In other words, they can live in volcanoes and toxic dumps, on polar caps, or even in that gunk under the refrigerator. This allows them to squeeze 50 percent more population out of the basic planet size. They also don't need to deal with pollution problems.

If you want to grow big colonies, playing a Tolerant race is a good way to go. However, the price for this ability is extremely high—especially considering that you can solve most planetary population and pollution problems through research and proper planning.

Expert Traders (4 Picks)

Races that are Expert Traders lead much more profitable lives than their less financially gifted opponents. They make 25 percent more profit off trade treaties, 50 percent more profit from the sale of Trade Goods, and twice as much money from surplus food sales.

A problem that many players new to the game experience is an early-game financial deficit. Even when they become more accustomed to playing, money problems still crop up at the most inopportune times. This Special Ability goes a long way toward solving fiscal problems throughout the game. Of course, if you learn to manage your empire well, you can spend these 4 Picks in a more advantageous area.

Telepathic (6 Picks)

Telepathic races are at an automatic advantage in the area of negotiations. They also have a multitude of other advantages, including a spying bonus and a bonus in planetary blockades and attacks. In addition, they gain immediate control of ships that they capture in combat.

You would be hard pressed to find a Special Ability that affects more fields of endeavor than this one. The many and varied advantages gained by Telepathic species make this ability a tempting prospect. This one really shines when one of the advantages it imparts is enhanced with an additional bonus or Special Ability—Charismatic, for example.

Lucky (3 Picks)

Lucky races never experience random disasters, and have a greater chance that they will benefit from random events and be overlooked by the Antarans.

How superstitious are you? Odds are you could make it through an entire game without experiencing any *serious* consequences resulting from random disasters. If you want the peace of mind that comes from knowing your only sources of trouble are your enemies and your own missteps, playing a Lucky race is the way to go. Otherwise, use your Picks elsewhere.

Omniscient (3 Picks)

Omniscient species can see everything in the galaxy, from planetary statistics to enemy fleets.

This Special Ability is, without a doubt, the best bargain on the market, and should be chosen for *every* custom race if at all feasible. The ability to see planetary systems and specifications just by clicking on the map eliminates the need for Scout fleets, allowing you to concentrate your production efforts on more important items, and use your Command Rating to control your war fleet. Also, the ability to see not only enemy ships, but also their courses, is the best early warning system you could wish for. You'll know many turns ahead of time when an enemy starts gathering ships for an assault on one of your worlds. Try this one; there's no better way to spend 3 Picks.

Stealthy Ships (4 Picks)

When a race has this Special Ability, their ships aren't visible on the main map under most circumstances.

Stealthy Ships are useful only for launching surprise attacks on enemy colonies and fleets. This is not a bad ability to have, but its use is limited. If this ability also affected combat in some way, and if it weren't useless against Omniscient races, it might be more valuable. As it stands, there are better ways to spend 4 Picks.

Transdimensional (5 Picks)

Transdimensional beings are capable of bending the fabric of space with their minds. This allows them to travel the vast interstellar distances 2 parsecs per turn faster than other races. In addition, it adds +4 to their battle speed and makes them immune to the Hyperspace Flux random event.

If you're a battle- and conquest-oriented player, this Special Ability is a perfect addition to your race's abilities. Superior interstellar speeds means fast empire expansion, and faster battle speeds means a potential combat edge even over more heavily armed vessels. When combined with Ship Attack and Defense bonuses, the Transdimensional ability becomes even more deadly.

Warlord (4 Picks)

Warlord races are able to field the best warriors. Their ship crews function at a higher ability level, and they can build ground troops more quickly than their opponents.

Even more so than the Transdimensional ability, Warlord is geared to the militaristic player. There is no doubt that the abilities it imparts are very useful in a battle situation. The ability to house twice the normal number of ground troops in every barracks is also helpful for more peaceful players who want to bolster their planetary defenses. However, peaceful players might be better served by an overall Ground Combat bonus.

Dave's Custom Race

I've tried many combinations of Attributes and Special Abilities, and have found that the following one works best for me:

- Dictatorship
- Omniscient
- Large Home World
- Creative
- -10 Spying

This combination allows the race to see everything in the galaxy and gives them all the technologies in every field. The Spying penalty has little effect on my style of play (I don't use Spies much), and the Large home world and the leftover 10 percent score bonus are just gravy.

John's Custom Race

Dave's race design is a good one, and I've used it myself. However, when you get tired of winning easily and want to challenge yourself, try this combination:

- Dictatorship
- Charismatic
- Creative
- Ancient Home World
- +1 Research
- -10 Ground Combat
- -10 Spying

By playing judiciously, you can win just as often with this race as with Dave's. The key is to make friends with everyone as soon as you meet them. Offer a nonaggression pact, a trade treaty, *and* a research treaty immediately; this prevents attacks surprisingly well. Whenever someone is foolish enough to attack you, call on all the other races to declare war on them, which they'll gladly do for the sake of the profitable treaties. Spend all your peaceful time researching like mad and building really big, nasty ships, then spread inexorably across the galaxy. By the time you start growing, nothing will be able to stand in your way.





CHAPTER 4

SHIP DESIGN

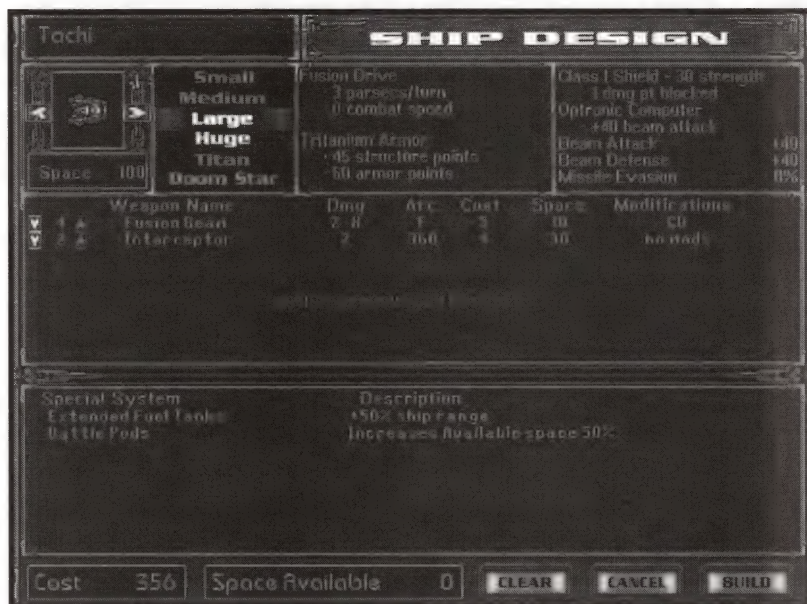


FIGURE 4-1. THE DESIGNING BOARD



EXT TO KEEPING YOUR COLONIES working smoothly, designing and building fleets of effective ships is probably most vital to success in MOO II. It's also one of the more complicated aspects.

Rather than providing specific, limited advice, we've chosen to present the secrets and inner workings of all the aspects of ship design that the game designers would talk to us about. We've incorporated our recommendations, but for the most part we leave you to make your own decisions. Ship design is a subjective art, after all. Where one person enjoys building a multitudinous fleet of tiny, quick ships, another might be comfortable with small groups of behemoth warships. Both (and anything in between) can be effective.

STRATEGIC DESIGN

Before we get into the details of designing ships, let's touch on an interesting alternative. You can completely avoid all the complications of ship design (and combat) and have it done for you, statistically. That's what the Strategic Combat option is all about. Playing the strategic game, you still decide when and where to build your ships, how many and what class (size) to build, and how you compose and move your fleets. What you *don't* do is outfit each ship class, refit ships, or personally direct ship-to-ship combat; the tactical element is removed.

In a strategic game, ship design works like this:

- You choose the class of ship you want to build.
- Every ship comes outfitted with the latest technology—the most destructive beam and missile weapons, plus the best special weapons—that will fit in its hull class. (We know this sounds vague. Check out Table 4-1 for the whole scoop.)
- If new technology is discovered after a ship is in service, the ship is upgraded automatically—no matter where it is—as long as it's still under your control.

The following chart details exactly how many of each type of weapon is installed on each size class of strategically designed ship—including planetary defense structures. Subject to some restrictions (explained in Chapter 7, "Combat"), every weapon is used once per combat turn. The table also covers how many special systems are included, how much bombing damage the ship can do to a ground target (a colony), and the number of hits it can take before

being destroyed. The "Defense" column applies only to attacks by beam weapons. The numbers there will make sense after you read about strategic combat in Chapter 7.

Table 4-1

Class (Size)	Beams	Missiles	Specials	Bombs	Defense	Hits
Small	1	0	0	0	30	4
Medium	2	0	0	0	20	15
Large	2	1	0	2	15	25
Huge	4	2	1	5	10	40
Titan	6	4	3	10	5	80
Doom Star	10	10	5	25	0	300
Star Base	3	3	0	0	-10	100
Battle Station	6	6	0	0	-10	200
Star Fortress	10	10	0	0	-10	500

What does all this mean in terms of playing strategy? For one thing, you never have to worry about refitting or scrapping obsolete ships. Another is that research becomes even more vital than in non-strategic games. Finally, in Strategic Combat games, finesse is not a factor; random "die rolls" decide ship combat. Bigger ships will regularly beat an equal number of smaller ships. (Though, there's always that long shot of several lucky rolls in a row.)

In strategic games, there is still a slim chance of one side or the other capturing a ship or two during combat. This is probably the only time you'll want to scrap a ship during a strategic game (unless you regularly run low on funds). You can still garner enemy technologies from captured ships—and they're instantly applied to every one of yours!

Since weapons and systems on captured ships are *not* updated like yours are, there's really not much point in keeping them around, even if you know you won't get any tech out of them. If you scrap them, at least you get a few BCs.

In a strategic game, you can't build a fleet on the strength of gimmicky or a bold design concept or even smart ship configuration. All that matters are the number and size of the ships, and intelligent command tactics. Strategic MOO II is a game with simpler rules, but chess has simple rules, too.

GENERAL CONSIDERATIONS

Scout		SHIP DESIGN	
id SPACE 20	Small	Nuclear Drive	No Shield
	Medium	2 warsec/turn	No Computer
	Large	III combat speed	+50 beam attack
	Huge	Titanium Armor	Beam Attack +10
	Titan	4 structure points	Beam Defense +50
	Beam Star	4 armor points	Missile Evasion 0%

FIGURE 4-2. THE OBVIOUS DESIGN DECISIONS ARE MADE FOR YOU.

Many of your ships' characteristics are not under your control. All the more reason to understand them as fully as you can.

Size

A ship's size classification is its most basic characteristic, so let's start there. Technically, there are six ship sizes, though the largest (Titan and Doom Star) are never used in shorter games. MOO II gives you six design slots, to accommodate all of them.

The size of a ship class affects more than just the amount of space available for the weapons and systems you want to put in. There's a hefty production cost for the big ships, as you've noticed if you've already played the game. A ship's ability to take damage is also based, in specific ways, on the size of the hull.



Note

A design slot for each size doesn't mean that each design has to be a different size. Early in the game the largest sizes are unavailable, so use their design slots for smaller ships. As long as the name of the ship class is not the same as that of any existing design, it won't replace that class. You should design your ships based on a purpose and your needs, not just size.

Table 4-2

Size (Class)	Base Cost	Space	Structural Hits	Computer Hits	Drive Hits	Shield Hits	Marines
Small	20	25	4	1	2	1	5
Medium	70	60	10	2	5	2	8
Large	250	120	30	5	10	6	12
Huge	600	250	50	7	15	7	20
Titan	1500	500	80	10	20	10	30
Doom Star	4000	1200	150	20	40	20	50

Cost and Space

The base cost of building a ship is the production price for the hull and necessary systems (drive, shields, armor, and computer). This base cost won't change, regardless of miniaturization. (The only way to speed up ship production is to increase production in the colony building it.) Anything you choose to add to the bare bones of the ship, however, jacks up the cost and uses some of the available space.



Note

In the last days of the design

process, things changed so that you have the option of installing obsolete shields and computers in your ships to save on cost and conserve space (due to miniaturization). Doing so is almost always foolish, but you know how some people are...

Maintenance

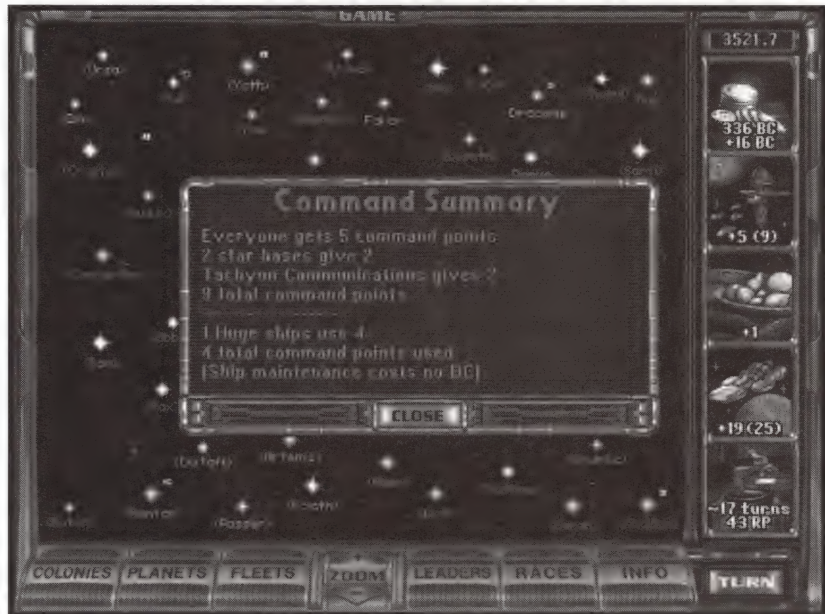


FIGURE 4-3. A HIGH ENOUGH COMMAND RATING SPARES YOUR TREASURY.

Every game turn a ship exists, it gets its maintenance from one of two sources—your Command Rating or your Treasury. This is, in essence, a check on the number and size of your fleets. Every ship costs its size in Command points—Small = 1, and so on. If you haven't got the Command Rating to cover all your ships, the deficit costs you a few BC per point per turn. It adds up fast, so watch yourself.

Hits

Whenever damage gets past a ship's shields and armor, it is applied to one of five areas. Normally, this damage is distributed at random, but some weapons specially target or do extra damage to specific areas.

Structural hits represent the integrity and strength of the ship's internal skeleton. When these are expended, the ship is destroyed, and it blows up.

Computer hits are less serious. When the computer system is destroyed, the ship loses any bonuses—typically targeting pluses—derived from the computer.

Drive hits are as severe as structural hits. When the drive sustains damage, it loses capability. Enough damage slows the ship, and a ship that can't move is a prime target for boarding parties. If the drive is destroyed, it explodes, taking the ship with it. Any ship in the immediate area takes damage from the explosion. (See Chapter 7 for the gruesome details.)



FIGURE 4-4. THIS IS THE CLASS III SHIELD GENERATOR



Note

Caution:

Don't make the mistake

of thinking your ship's Marines can make landfall and attempt to conquer an enemy colony. Only a Transport Ship filled with ground troops (unfortunately also called Marines) can invade a colonized planet.



Note

Before MOO II's release, there was some controversy over the designers'

decision to have the best of the standard systems automatically installed in every ship. Though they meant it as a convenience to speed ship design, not everyone saw it that way. Experienced players of the original *Master of Orion* often chose to install obsolete systems in their ships to save space for other things. Designing this way, they'd sometimes build tiny ships with massive engines, incredible speed and range, but no weapons, shields, or armor. Some designed behemoths with almost no range or maneuverability, but enough weaponry that motion was all but unnecessary.

Fortunately, the MOO II designers had also played the original game, and they realized that flexibility in ship design was one of the most fun parts of MOO. Thus, the automatically installed systems were considered part of the hull; they do not subtract from the ship's available space. They retained the design flexibility in the special systems and weapons modifications. Using these alone and in combination, a ship designer can exaggerate any feature of the ship—even to ridiculous extremes.

Shield hits represent damage to the shield generator. Partial damage doesn't weaken a ship's shields, but once this system is completely gone, so are the shields—no matter what shield-enhancing special systems are installed.

The last of the five areas is the complement of Marines stationed onboard.

Marines

The Marines on board a ship serve two functions. They make up the boarding parties you send against immobilized enemy ships, and they defend against opposing boarding parties. This might seem unimportant, but capturing ships is a cornerstone of good strategy.

Any time the ship takes damage to any internal or structural system (not armor or shields), there is a small percentage chance per point of damage that a Marine is killed. If the entire complement dies, the ship can no longer mount a boarding action or defend against one.

AUTOMATIC STUFF

All the essential parts of every ship—drive engine, fuel cells, computer, shields, and armor—are installed automatically with the hull. Thus, your ships' basic characteristics—range, speed, and toughness—depend almost solely on your research efforts.

A ship's basic systems are selected when you add that ship to a colony's Build Queue. Whatever the state of your research at that moment, it's frozen into the ship design. If you make serious progress after the ship is built—except in fuel cells and engines, which are updated for you—you'll have to wait for an opportunity to refit. (Refits normally don't take too long.)

If the ship isn't done, however, you can "prefit" the half-built hull. If you have at least two turns before the ship will be completed, you can click twice to remove the ship from the Build Queue. Reselect the class to replace the ship in the queue, then move it to the first slot. Production picks up where it left off, with only a minor (usually) increase in the leftover build time.

Drives



FIGURE 4-5. ONE OF THE EARLY NUCLEAR DRIVES

The type of drive a ship has affects only two things—interstellar speed (measured in parsecs per turn) and the amount of motion—flight and turning—possible during each turn of combat (combat speed). The combat speed provided also depends on ship size; naturally, larger ships have less maneuvering agility.


Table 4-3

Drive	FTL Speed	Combat Speed					
		Small	Medium	Large	Huge	Titan	Doom Star
Nuclear	2	10-20	8-18	6-16	5-15	4-14	3-13
Fusion	3	12-22	10-20	8-18	7-17	6-16	5-15
Ion	4	14-24	12-22	10-20	9-19	8-18	7-17
Antimatter	5	16-26	14-24	12-22	11-21	10-20	9-19
Hyper	6	18-28	16-26	14-24	13-23	12-22	11-21
Interphased	7	20-30	18-28	16-26	15-25	14-24	13-23

Computers

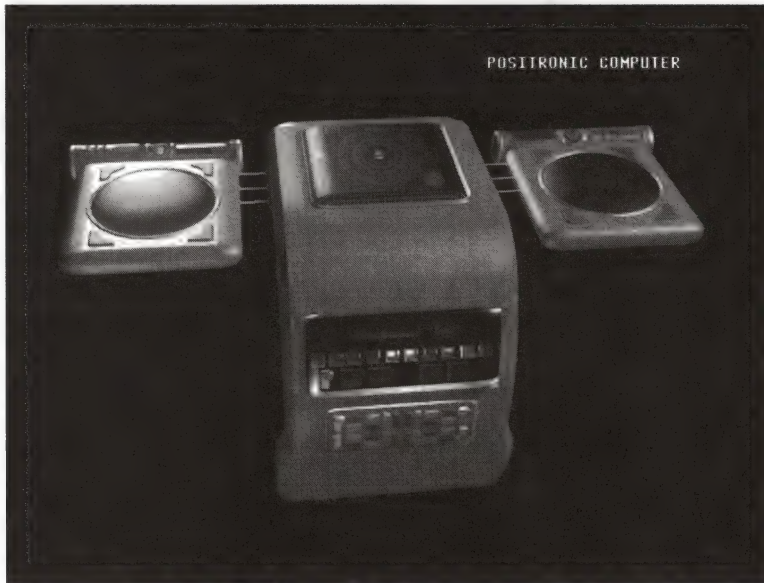


FIGURE 4-6. THE POSITRONIC SYSTEM

Computers provide targeting bonuses during combat for all beam weapons. They don't do anything else, but that's enough.

Table 4-4

Computer	Beam Targeting Bonus
Electronic	25%
Optronic	50%
Positronic	75%
Cybertronic	100%
Moleculartronic	125%

Shields

Before damage from any weapon reaches a ship, it must pass through the first defensive perimeter—the shields. Each of the four shield facings (front, back, and sides) begins with the same strength: five times the size class of the ship multiplied by shield class:

$$\text{Strength} = 5 \times (\text{Class} \times \text{Size})$$

“Size class” is simple. Small equals 1, Medium 2, Large 3, Huge 4, Titan 5, and Doom Stars are size 6. A shield’s class is part of its name, as in “Class III Shields.” (For those of you who don’t feel like figuring it out, there’s a chart.) Once a shield absorbs its strength in incoming damage, it goes away for the rest of that combat turn.

Between turns in combat, a ship’s shields automatically recharge 30 percent of the strength of the strongest facing. This recharge is split up evenly between all the damaged shields. If the ship doesn’t use all its possible movement allocation, the shields recharge further, up to another 30 percent. Whatever fraction of movement is left, the ship gains that portion of the additional 30 percent. So, for example, if you used half a ship’s movement (50 percent), you’d get an extra 15 percent recharge (50 percent of 30 percent).

Table 4-5

Shield Class	Small	Medium	Large	Huge	Titan	Doom Star
I	5	10	15	20	25	30
III	15	30	45	60	75	90
V	25	50	75	100	125	150
VII	35	70	105	140	175	210
X	50	100	150	200	250	300

The Antarans have a special type of shield called a Damper Field. This simply blocks one-quarter (25 percent) of all the damage inflicted on the ship. No race in the game can gain this technology through simple research. The only way to obtain Damper Field technology is to capture Antaran ships. Of course, that's rather difficult, and there's no way to determine exactly what technology you'll discover from any captured ship. If you get Damper Fields and choose to install them in a ship, they replace the shields on that ship.



Armor

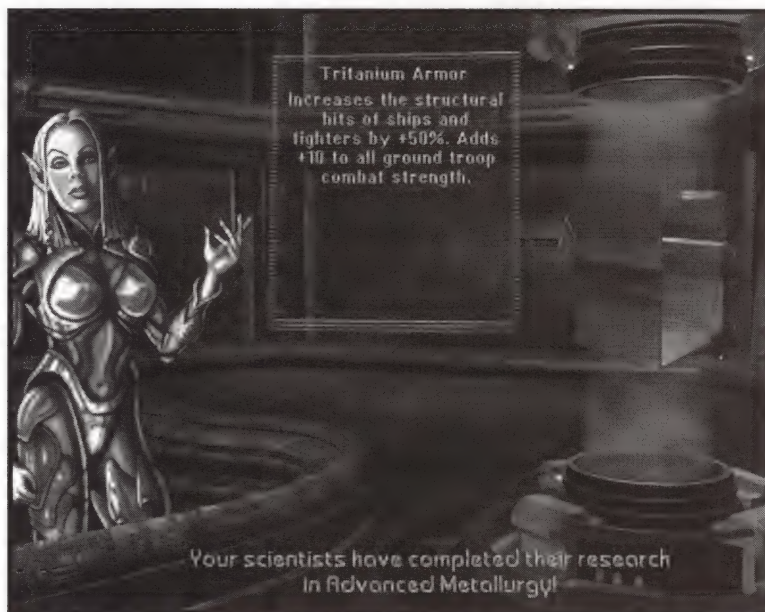


FIGURE 4-7. TYPICAL ARMOR

The second defensive perimeter around every ship is its armor. Armor temporarily prevents normal weapons (those that get past the shields) from damaging internal systems. Damage won't affect a ship's Structural, Computer, Drive, and Shield Hits until it has destroyed the armor completely. The exceptions, of course, are Armor Piercing weapons and EMP devices. Both of these ignore armor (at least partially) and do internal damage. Xentronium armor blocks armor-piercing weapons, and you can get the same effect by adding the Heavy Armor special to any type of armor. No armor type or upgrade has any effect on EMP weapons.

What armor really does is twofold. First, armor *adds to* the Structural Hits a ship can take before being destroyed. Second, the armor can absorb hits equivalent to the ship's new number of Structural Hits. The structural addition is made before Armor Hits are calculated. So, for example, a small ship with Xentronium armor would have 40 Structural Hits ($4 + 900$ percent of $4 = 40$) and 40 Armor Hits.

Table 4-6

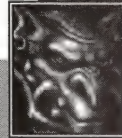
Armor	Structure Bonus
Titanium	0%
Tritanium	100%
Zortium	300%
Neutronium	500%
Adamantium	700%
Xentronium	900%

Fuel

The type of fuel cell installed in a ship determines its base range. No vessel can travel or exist farther than its maximum range from one of your colonies or outposts.

Table 4-7

Fuel Cell	Base Range
Standard	4
Deuterium	6
Iridium	9
Urridium	12
Thorium	Unlimited


Tip

The strategy in this range limitation is obvious. If one of your opponents relies on military outposts to extend ship range, take advantage of this weakness. Outposts are much easier to destroy than colonies, which are likely to be more heavily defended. As soon as you put the outpost out of commission, all the ships caught suddenly out of range of any other refueling point must go home. This is a low-risk way to limit the effectiveness of enemy fleets.

THE DEFAULT DESIGNS

Just like the makeup of your starting fleet, the default ship designs depend on the civilization level you're playing (Pre-Warp, Average, or Advanced). What all three levels have in common is that the designs are all generalized, and thus probably not well suited to your intentions. One of the first things you should do in any game—certainly before you build any new ships or refit existing ones—is check the default designs. Redesign every class that doesn't fit your needs.

PRE-WARP

In a Pre-Warp game, you don't have any ship designs, and you won't have any for a while. Before you'll be allowed to design or build ships to cross the interstellar distances, you *must* complete research into both of these:

- *Nuclear Fission* is the most basic research into Power. This gives you only the pathetic Nuclear Drive, but it's better than nothing. It also gets you to the next Field in Power, which gives you the ability to build Colony and Outpost Ships, Transports, and Freighter Fleets.
- *Chemistry*, in Chemistry, lets you build Titanium Armor. Without it, the stress of FTL acceleration would tear any ship to ribbons. This scientific advance also allows the Standard Fuel Cell, an energy source compact and light enough to make interstellar travel feasible. As a bonus, you get Extended Fuel Tanks to extend your scouting range.



FIGURE 4-8. THE EXTENDED FUEL TANK IS ONE OF THE BEST AND EARLIEST SHIP SYSTEMS.

If scouts are all you need, that's enough research to start a small exploration fleet. Before you can really get your empire off the ground, though—or even defend yourself—you need some expansion capability and firepower. True, you can put Nuclear Bombs on your ships, but they're no good for ship-to-ship combat or fights with space monsters (until much later, when you get Bombers). Nuclear Missiles, though able to target ships, have limited utility. Use them only if you really can't wait to get out there and explore.

As an expansionist player, your next few research goals depend on how much patience you have:

- *Cold Fusion* is absolutely mandatory. Without it, your empire has no internal, non-military transportation, and colonies will starve in short order.
- *Physics*, first field in the Physics category, lets you add Laser Cannon to your ships. This is nice, and when you're done, you can go directly to ...
- *Fusion Beam*, an application of Fusion Physics, takes a while to research this early. On the other hand, the Fusion Beam is pretty much almighty at this point. Quite a nice weapon, it knocks down defenders' shields far more quickly than those silly Laser *Cannons*. The Fusion Beam will serve well—especially in Heavy Mount and Continuous form—for a long time.
- *Advanced Magnetism*, in Force Fields, gives you Class I Shield technology and the Mass Driver weapon.
- *Electronics* is the first goal in Computers. This gives you the most basic Electronic Computer for enhanced weapons targeting.



Tip

As a bonus, the science

you've already done leaves you on the verge of Cold Fusion, which allows you to build Freighters, Colony Ships, Outpost Ships, and Transports—all the basic nonmilitary transportation your empire will ever need. Keep in mind, though, that if your home system contains other habitable planets, you don't want to waste a Colony Ship on them. The Colony Base is cheaper to build and fulfills the same function.

Once you complete the initial research fields, the lowest level of default ship designs kicks in.

Small

The smallest class of ship you can build has 25 units of available space. This is the one you're most likely to want to build immediately. The two default Small designs don't take into account that you probably want a scout; they fill up the available space with Nuclear Bombs and Missiles (no modifications, either). Use that Clear button.

Range is the most pressing consideration for your early scout ships. None of your vessels can travel or safely exist farther from one of your colonies or outposts than its range allows. Because Standard Fuel Cells give you a range of only 4, you should spend a few units of space and production cost on the Extended Fuel Tank. This extends your scouts' range to 6.



Note

Keep in mind that you can design one,

two, or even five Small ship types. Thus, you could keep build time down and gear up a big fleet of specialized mosquitoes quickly—one for scouting, one for bombing, and so on. Specialization is not a problem; the trouble comes when you're paying maintenance on all those ships every turn. Moderation!

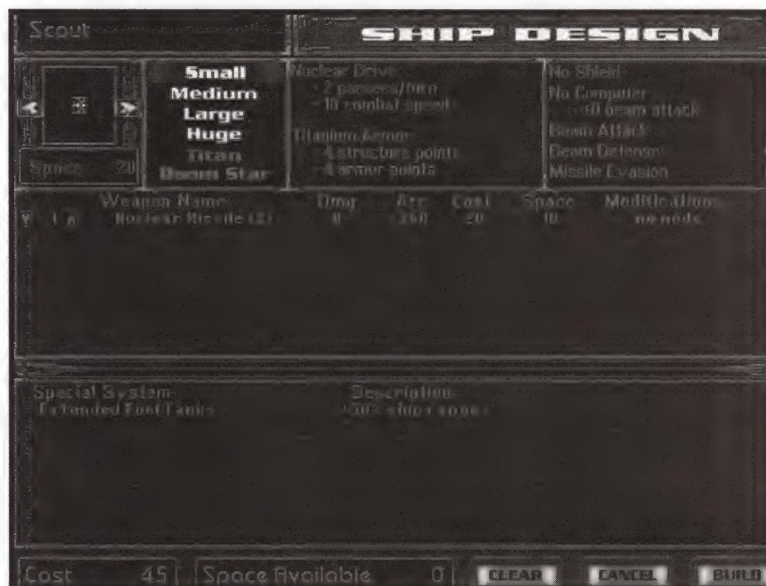


FIGURE 4-9. YOU DON'T NEED TO GET TOO FANCY WITH YOUR SCOUTS.

Weapons are optional. They add to design cost, which means each ship takes longer to build. Even this early in the game, though, you have reason to arm your scouts. Chances are slim that there are hostile races nearby (unless, of course, you've stuffed eight races into a small galaxy), but you could run into a space monster at any system you visit. You want your scouts to be able to survive the one turn it takes to retreat. On the off chance you *do* encounter another race, they won't be much more advanced than you, if at all. Don't ignore any early opportunity to get rid of a helpless enemy—or better yet, force them to serve you.

If you decide to arm your scouts, your offensive options are limited until you do more research. The Nuclear Missile launcher is *it*. If you already have Extended Tanks, you have room for one 2 Rack missile setup with no modifications. That's not much, but you can dispose of the Extended Tanks if you're dead set on firepower. In this case, we suggest you go for the biggest rack (more missiles); most of the mods aren't necessary this early in the game. If you prefer, you can trade down to save space and get a quicker build time.

Nuclear Bombs are no good for combat this early; they're strictly a space-to-ground weapon. When you know where there's a planet that needs bombing, you can design and build a ship with bombs. (If you want to destroy the colony, not just harass it, you'd better make it at least a Medium hull.)



Tip

You don't have to fill up all the space a hull has. Leaving unused space cuts down on the time and cost of building the ship.

All the Others

The Pre-Warp default design for the next three ship sizes is nothing but bigger versions of the same—Nuclear Missiles and Bombs. This is, of course, intolerable.

For the ships you build to be able to reach the places your scouts find, extended fuel tanks would seem a necessity. There's plenty of room for them, too. Otherwise, you've still got that lack-of-exciting-weaponry problem. Using loads of Nuclear Missiles is your only real option at this point.

Modifications can be helpful here (as soon as you research one more Power field). Add 25 percent to the missiles' space and cost for each. *Fast* missiles steal valuable time that the defenders would otherwise use to destroy them on the way in. *Heavy Armor* makes each projectile tougher to destroy. *ECCM* is useless right now; it's extremely unlikely any of the other races has developed jamming technology yet.

You can't build Titans until you've researched Large Scale Structural Engineering. Doom Stars aren't available until you've finished researching Planetoid Construction.

AVERAGE CIVILIZATION

At the beginning of an Average Civilization game, you've already completed research into Nuclear Fission, Cold Fusion, Chemistry, Electronics, Physics, and Engineering. Therefore, your automatically-installed systems are the Nuclear Drive, Standard Fuel Cells, Titanium Armor, and Electronic Computers. You have no shield technology, but Laser Cannon are available.

The default ship designs are far more reasonable than those in a Pre-Warp game, as well.



Tip

You might question the intelligence of

trying to build Large or Huge ships this early. By the time you finish one of these, you're thinking, advancing research certainly will have made it obsolete. You're right. Of course, you can refit the ships before you send them out, but that seems pointless.

What to do?

Well, that's one of the beauties of modern construction techniques. You can interrupt the process by removing the ship from the build queue (as long as at least two turns remain before its completion), redesign the class to bring it up to date, then replace it in the first slot in the queue. Production picks up where it left off, with only a minor (usually) increase in leftover build time.

Small

As with the default designs for a Pre-Warp game, you begin with two Small ship classes. The first is set up to be a Scout. It includes:

- Extended Fuel Tanks, and
- Laser Cannon with no modifications.

So far, so good. The other class is where things get interesting. In Average and Advanced games, all but the first Small ship design come up differently every time you start a new game. They're not exactly random, because the hull size and available technology limit the design, but they're not what you'd call well thought out, either.

For the second Small ship, the possibilities are somewhat limited, considering the small hull and dearth of equipment. Thus, this design is almost invariably:

- One unmodified 5-Rack of Nuclear Missiles, and
- Some Nuclear Bombs.

This makes a nice little colony bomber, but it doesn't carry enough bombs to efficiently destroy a colony. It's useful for harassment and suppression—if you decide to use it.

All the Others

All other sizes intermix the available weapons:

- Laser Cannon (sometimes with a Forward Extended firing arc),
- Nuclear Missiles (2, 5, and 10 Racks), and
- Nuclear Bombs,

in various numbers. Modifications are unusual. You'll almost certainly want to redesign these. The same missile modifications are available as in the default Pre-Warp designs (*Fast*, *Heavy Armor*, and *ECCM*).

The only serious consideration now is the efficacy of beam weapons versus missiles. Missiles never miss, but they take time, and most of them get destroyed in flight. Beams often miss, but the results are immediate. We'll take this up later on, under "Weapons."

You still can't build Titans until you've researched Large Scale Structural Engineering. Doom Stars aren't available until you've finished Planetoid Construction.

ADVANCED CIVILIZATION

What happens in the Advanced Civilization game depends entirely on which fields of research you have at the start of the game. The only guarantee is that you'll be able to do somewhat more than you could at the start of an Average game. You might be stuck with the slow Fission Drive, but have shiny new Positronic Computers. You could end up with the Interphased Drive, but with pathetic Standard Fuel Cells to run it.

The first Small ship design, as always, is your scout. It includes:

- Extended Fuel Tanks, and
- the most damaging beam weapon available, with no modifications.

As in the Average start, all the other designs intermix the available weapons aimlessly. Investigate them all before you build any. You'll probably want to redo all of them.

Even in your advanced state, it's for sure that you still haven't researched Large Scale Structural Engineering and Planetoid Construction. The megaships will have to wait.

WEAPONS



FIGURE 4-11. THE EVER-POPULAR STASIS FIELD

Naturally, the most interesting optional systems are the weapons. Combat would be pretty dull without them. We haven't room to go into lengthy detail, but we do address every weapon in the game—cost, size, potential damage, the bonus it gives in strategic combat, and a brief evaluation.

Probably the biggest question most beginning players have is, Should I use beam weapons or missiles? The answer, of course, is, *Both!* They have complementary strengths and drawbacks, so mix them. We won't presume to dictate your ship designs, but we've found that the most effective fleets—*not ships*, mind you, but *Fleets*—strike a pretty even balance between missile and beam weapons, with a heavy dose of fighters and special weapons, once they become available.

MINIATURIZATION

Before you start cramming weapons into your hulls, it pays to remember the effects of miniaturization. Not only do your more primitive weapons take up less space as your research progresses, they also take less time to produce.

Naturally, the weapons progression is designed so that miniaturization doesn't make a bunch of older weapons obviously more powerful than a single newer one that takes up the same space. Let's not forget about power-building modifications, however, and the fact that multiple weapons have that many more chances to hit than a single one.

The fact is, your newest weapon is probably your most powerful. If you can fit two of an older one in the same space, though, and still have room to add a Point Defense missile killer, you might be better off. Never overlook defense for the sake of a glitzy new gun.



Note

Caution: Not all weapons and systems

can be miniaturized. The descriptions in the game manual note the exceptions.

Table 4-8

# Fields Beyond	Weapons Size	Special Systems Size	Cost
0	100%	100%	100%
1	80%	85%	75%
2	65%	70%	55%
3	50%	60%	40%
4	35%	50%	30%
Over 4	25%	40%	25%

BEAMS



FIGURE 4-12. FUSION BEAMS CAN SERVE THROUGHOUT THE GAME.

On first inspection, beam weapons might seem more attractive than missiles. Their effects are immediate (instant gratification), they can't be shot down en route, and many beams can be used to destroy incoming projectiles. The downside, though, is that they often miss, and the amount of damage they do is unpredictable and usually diminishes with range.

Here's a chart that should have been in the game manual. (It's in alphabetical order.)

Table 4-9

Weapon	Damage	Size	Cost	Strategic Damage	Special
Death Ray	10-100	30	75	10-40	Kills Marines
Disruptor Cannon	40	20	25	20	—
Fusion Beam	2-6	10	6	2-6	—
Gauss Cannon	18	10	10	18	—
Graviton Beam	3-15	15	12	5-15	2 x Structural Damage
Ion Pulse Cannon	2-16	15	15	1-15	EMP
Laser Cannon	1-4	10	5	1-4	—
Mass Driver	6	10	7	6	—
Mauler	100	50	75	25	2 x Range Penalties
Neutron Blaster	3-12	10	8	3-12	Kills Marines
Particle Beam	10-30	15	35	5-25	Shield Piercing
Phasor	5-20	10	10	5-20	—
Plasma Cannon	6-30	10	15	6-24	Enveloping, 2 x Range
Penalties					
Stellar Converter	400	500	500	300	Enveloping, No Range Limit

Let's look at these systems one at a time. Since the game is pretty well balanced, every weapon has strengths and weaknesses—only the Antarans have game busters (which you should capture at the first opportunity). We'll take them roughly in order by damage, weakest first.

Laser Cannon

This is the weapon of choice when you have no choice. Somewhat useful in great numbers, it's still outmatched by the Mass Driver in every way, even after taking miniaturization into account. The extremely low damage potential is offset slightly by the variety of modifications available, but the list doesn't include the one that might redeem this wimp: Shield Piercing.

Possible Mods: Heavy Mount, Autofire, Armor Piercing, Point Defense, No Range Penalties

Mass Driver

Good in the early game, the Mass Driver doesn't lose its edge until Gauss Cannons come on stage. It's a workhorse. Allied with Fusion Beams, this weapon can serve throughout the game. It's especially good in Point Defense as a missile destroyer.

Possible Mods: Heavy Mount, Autofire, Armor Piercing, Point Defense

Fusion Beam

Like the Mass Driver, this is a weapon you can put to long use. It's a solid offensive and defensive item, without being too expensive. The Fusion Beam is great at knocking down enemy shields. Used well (in Heavy Mount, Continuous, Enveloping groups), it can retain its utility until Plasma Cannons are available.

Possible Mods: Heavy Mount, Enveloping, Continuous, Point Defense

Ion Pulse Cannon

This does more damage than the Fusion Beam, but the EMP effect makes it more than twice as costly. EMP is nice for ignoring armor and destroying ships, but if your plan is to weaken and capture, it's troublesome. It's too easy to accidentally scrag your booty. For the cost, this is not necessarily the best choice, unless you can also afford both the Autofire and Continuous mods, which make it killer.

Possible Mods: Heavy Mount, Autofire, Continuous

Neutron Blaster

This is the earliest Marine killer you can research, and well worth it. Anything that makes life easier for your Assault Shuttles and boarding parties is a good thing. Costs less than the Ion Pulse Cannon, too. Just be careful not to kill the whole crew before you send in your own Marines.

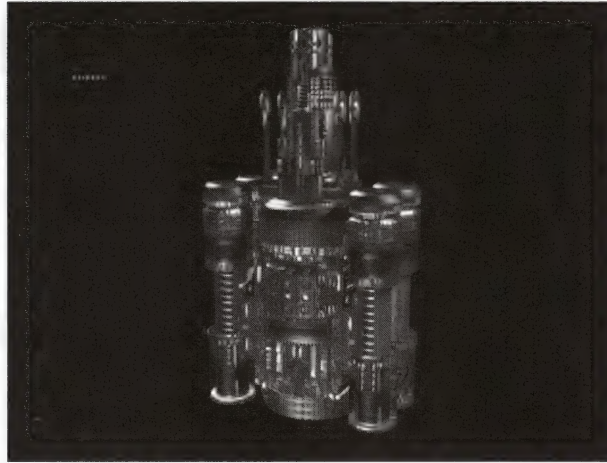
Possible Mods: Heavy Mount, Continuous

Gauss Cannon

Gauss Cannons are a solid replacement for the Mass Driver. The damage is triple, but the costs are not. These work well in combination with almost any other weapon. Heavy Mount is a must, if hull space allows.

Possible Mods: Heavy Mount, Autofire, Armor Piercing

FIGURE 4-13. A
SHIELD-PIERCING
PHASOR IS A
MIGHTY THING.



Phasor

This beam falls in a weird middle range. Yes, it's better than the Fusion Beam, but not vastly (after you take miniaturization into account). No, you don't have Plasma Cannons yet, but it won't be long. Spending the time to install these is a judgment call, unless you go in for the awesome Shield Piercing modification. With the exception of the Antarans, other races use shields—and they're the most annoying thing standing between you and a blown-up enemy ship. Then there's the incredible Autofire/Continuous combo ...

Possible Mods: Heavy Mount, Continuous, Autofire, Point Defense, Shield Piercing

Graviton Beam

If you're out to destroy ships without concern for capture, the Graviton Beam is an effective choice. Though its damage is a little less than that of the Gauss Cannon and the Phasor, the effect on Structural Hits doubles that. This weapon works best in combination with a shield destroyer like the Plasma Cannon—or with its own, wondrous Shield Piercing modification.

Possible Mods: Heavy Mount, Continuous, Shield Piercing

FIGURE 4-14.
THE GROUND
COMBAT VERSION
OF THE PLASMA
CANNON



Plasma Cannon

Double range penalties are the only drawback to this beam, but it's a serious one. You'll need to combine Plasma Cannons with some other weapon. (Gauss Cannon is good, and missiles don't have range penalties.) Otherwise, this is a good buy. Enveloping beams hit all enemy shields at once—essentially quadrupling the damage they do.

Possible Mods: Heavy Mount, Continuous, Armor Piercing

Death Ray

Just like the Neutron Blaster, only better—much, much better. This is an Antaran weapon, so you might never have a chance to use it.

Possible Mods: Heavy Mount

The Disruptor Cannon is the next step in the Mass Driver/Gauss Cannon family of weapons. With better than twice the damage of the Gauss Cannon, it's a solid hitter. Miniaturization is the problem. If your research into Force Fields has progressed far enough, two Gauss Cannon are cheaper and smaller than one Disruptor Cannon.

Possible Mods: Heavy Mount, Autofire

*Disruptor Cannon
Particle Beam*

Two words: Use It. This is the only naturally Shield Piercing beam weapon in the game. It's also the last real bargain in this list; both the Mauler Device and Stellar Converter have serious drawbacks. Add Armor Piercing and Heavy Mount to this puppy, and you've got a one-shot ship killer. Of course, you have to wrest this one from the Antarans first.

Possible Mods: Heavy Mount, Continuous, Armor Piercing, Point Defense, No Range Penalties

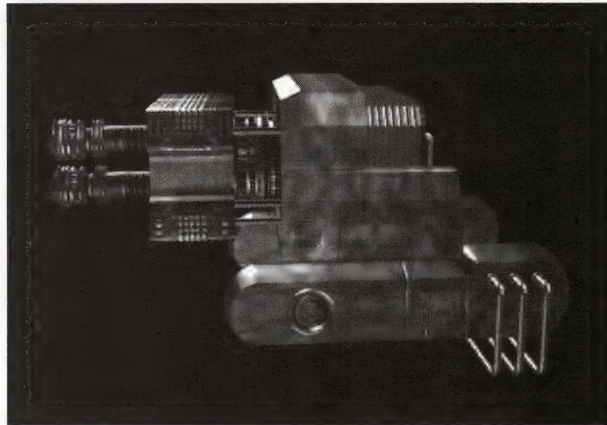


FIGURE 4-15. DON'T
FIRE UNTIL YOU SEE
THE FACETS OF
THEIR EYES.

This sucker does big damage, but it's expensive. Also, the range penalties make it nearly useless except at close range—where it's a killer. Use it with a Phase Cloak or on a fast ship.

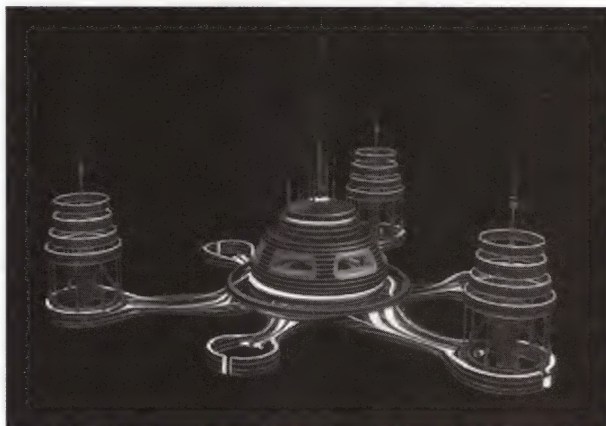
Possible Mods: Heavy Mount

Mauler Device
Stellar Converter

If you're already ruling the galaxy, you could install this expensive behemoth in a ship just for fun. You can use it to defeat the Guardian of Orion, or as a one-shot ship killer. Otherwise, it's of limited utility. We've found the best use for it is destroying those pesky enemy colony planets. The converter is overkill, but overkill can be fun.

Possible Mods: None

FIGURE 4-16. THE
STELLAR CONVERTER
IS OVERKILL ON A SHIP,
BUT AWESOME FOR
COLONY DEFENSE.



Firing Arcs

Are extended firing arcs useful? Sometimes. When the time comes to fight the Antaran fleets, you want to have 360-degree weapons. Their ships move quickly, and once they get behind yours (which they will), then start flitting around like caffeinated hummingbirds (which they do), you might not be able to swivel and fire to best effect. You certainly won't have the movement points to turn *and* maneuver *and* fire. When facing off against the other races, though, they're of lesser necessity. If you've got the luxury of extra space in a hull and a little spare building time, go ahead and use them. In a pinch, turning your ships is cheaper and almost always works—unless the engines are damaged, of course.

Remember, missiles and fighters are *always* 360-degree weapons. They lack the immediacy of beams, but are not subject to the effects of the Antarans' Reflection Field. At close range, even the Antarans can't shoot them all down. Of course, if you're really hooked on beams, other weapons just aren't the same.

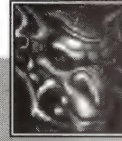
Modifications

Heavy Mount might seem at first glance to be a white elephant. At double the cost and size for only 50 percent more damage, it doesn't look like a bargain. However, once you take the halved range penalties into account, the extra damage is usually over 100 percent. Half penalties also mean doubled range. As long as you have something else to shoot at missiles and fighters with, this is a nice mod.

Point Defense is absolutely essential when fighting an enemy who uses missiles or fighters. Double range penalties mean half damage and half the effective range. Half damage at half cost and size seems fair, but add the 25 percent bonus to hit, and this mod turns into a bargain. Combine this with Continuous, and you get a 50 percent "to hit" bonus.

Armor Piercing is good, but not great. Early in the game, when shields are weak and puny, this is a useful mod. Once you get through the shields, you can ignore the armor and go right for the ship's guts. Later, though, strong, regenerating shields become the biggest impediment to your beam attacks. It's not until the late game, when everyone has Damper Fields (which aren't technically shields), that AP suddenly becomes useful again.

Continuous is not a bargain—a 25 percent bonus to hit for a 50 percent increase in cost and size. This mod works well in combination with other mods, especially Autofire and Point Defense, but the cost can be a problem.



Tip

Back arcs entail no extra cost, but why

would you want to pay full price to add a whole new weapon with a Back arc when a 360-degree arc only adds 50 percent? Well, one strategy we've seen used effectively is a ship with lots of Assault Shuttles and *only* Back arc beams. As fast as possible, this ship flies straight past the enemy fleet, then launches all its shuttles and starts firing away, without bothering to turn around. Most of the enemy weapons that might destroy the shuttles are front-mounted, after all.

No Range Dissipation would be cheap at double the price. In Chapter 7, you'll see how damage drops off as a function of range. You won't like it, and this is the solution. This mod is also inexpensive enough to be combined with others.

Shield Piercing is our pick for the best single mod there is against fleets not equipped with the Damper Field. (Unfortunately, the field isn't considered a shield, even though it takes the place of one.) SP is fairly inexpensive, and it cuts out most ships' first line of defense. Armor doesn't normally regenerate between rounds of combat, so all the damage you do stays done, unlike damage to shields.

Autofire adds 50 percent to the cost of a weapon. It inflicts a 20 percent "to hit" penalty. The ability to fire three times per turn is hardly worth the cost, *unless* you combine it with the Continuous mod. The Continuous 25 percent bonus more than wipes out the 20 percent penalty, and you still get to fire three times! This makes for one expensive weapon, and only the Ion Pulse Cannon and Phasor allow both mods.

Enveloping doubles the cost and size of a weapon. Any mod that adds that much is of questionable value. Question all you want, but use this modification when you can. The extra cost is nasty, but you get *quadruple* damage for it. (That's four times, for you math majors.)

MISSILES & TORPEDOES

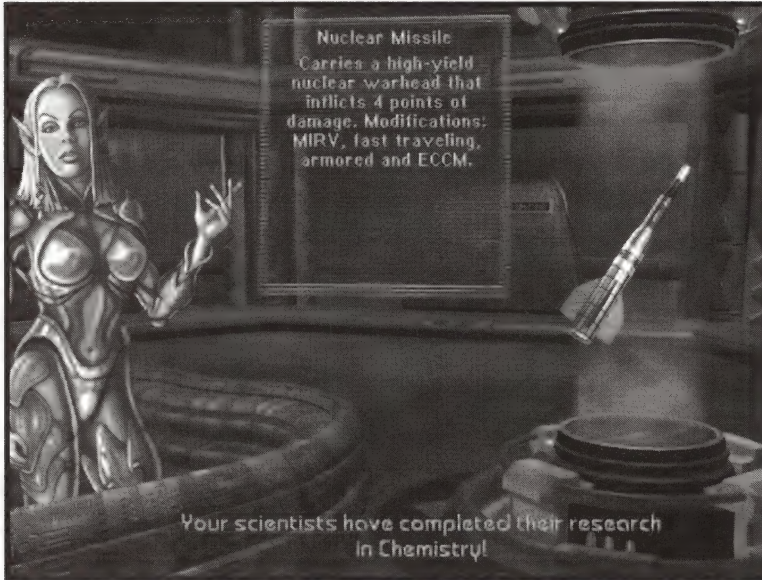


FIGURE 4-17. THE ALTERNATIVE TO BEAMS

Missiles never miss, the manual says—unless they're shot down on the way in or deflected by jamming equipment. Oh. The delay between launch and strike is one of the two biggest problems with missiles. The other is ammunition—it runs out. On the other hand, missiles have a 360-degree firing arc, don't lose power with range, and aren't bounced back by that sneaky Antaran Reflection Field. Torpedoes are a similar ball game. They don't run out of ammo, but only fire every other turn. They can't be shot down, but they're affected by jammers.

In all, the beam/missile decision is a matter of personal style. The advantages and disadvantages are designed to come up about even, and they do. The best fleets take advantage of both.

Here's another table the game manual really ought to have included. (We list the weapons by the amount of damage they do.)

Table 4-10

Weapon	Speed	Damage	Hits	Size' (2/5/10/20/30)	Cost' (2/5/10/20/30)	Strategic Damage
Nuclear Missile	*	8	4	10/20/30/35/40	10/20/30/35/40	8
Merculite Missile	*	14	6	10/20/30/35/40	10/20/30/35/40	14
Pulson Missile	*	20	8	10/20/30/35/40	10/20/30/35/40	20
Zeon Missile	*	30	10	10/20/30/35/40	10/20/30/35/40	30
Antimatter Torpedo	20	25	n/a	30	15	25
Proton Torpedo	24 ²	40	n/a	30	20	40
Plasma Torpedo	24	120 ³	n/a	40	75	300%

* The speed of any missile is 12, plus 2 for every drive beyond Nuclear that you've researched.

1. The size and cost of missile systems depends on rack size.
2. The Proton Torpedo is a direct-fire weapon; its speed is essentially the same as its range.
3. The Plasma Torpedo does 5 less damage for each square it travels to its target.

All missile systems have the same effective characteristics, so there's no point in going over them all one by one as we did for beam weapons. Go down the list in Table 4-10. The missile you have that does the most damage is the one to use. They all take up the same amount of space and cost the same.

The same goes for torpedoes. As soon as you finish researching a new torp, install it in place of the old one.

Racks

This section applies only to missiles, since torpedoes never run out of ammunition. (That's one serious argument for using torpedoes, by the way, if you can stand to fire only every other turn.) The size rack you install determines how many times you can fire that missile in any one battle. Should you install bigger racks or more missile systems? It's really a simple decision when you look at the numbers. For the price (in cost and size) of a rack twice the number, could you install two systems with the smaller rack? The answer is always no. Thus, the important thing is what you want out of your missiles.

If you want lots of projectiles in the air at once, but you only expect to fire missiles during the first few turns, stick with small racks and put in lots of them. (Don't forget Fast Racks.) This is a good strategy for preventing all your missiles from being shot down. The more there are en route, the less likely it is that the enemy can destroy them all. If your battles are usually short, go with this option.

If you expect some protracted battles in which you might want to fire missiles more than two or five times, go with the big racks. To help prevent them all being zapped, try the Armored and Fast mods. Also, don't fire until you're close; that gives your projectiles less space to cross before impact.

Mods

ECCM halves the chance of your missiles being deterred by jamming equipment on the other ships. That sounds good, but is it worth the extra 25 percent cost and size? Hard to say. We've never had a missile go wild due to jamming; mostly, the bad guys shoot 'em down. Unless you know you're being jammed, don't bother.

Enveloping is relevant only to torpedoes; you can't use it on missiles. It's the same as the beam weapon modification, so we won't belabor the point. Basically, you pay twice the cost and size to do four times the damage—bargain of the year.

Fast is our favorite cheap mod. The faster your projectiles move, the less time your opponents have to shoot at them. The speed plus also raises the defense rating of the missiles, making them harder to hit. Since getting shot down is the main problem with missiles, it's certainly worth the mere 25 percent increase in size and cost.

Heavily Armored ain't bad. For an extra 25 percent size and cost, you get a missile that's tougher to destroy. Here's the catch: It uses the best armor you've researched. If you only have Titanium Armor, this mod is worthless. Look at Table 4-6 if you don't believe us. Tritanium makes this a good deal, and any better armor is certainly worth the cost.

MIRV is the missile equivalent of *Enveloping*. For a 100 percent boost in cost and size, you get four warheads in one. The manual isn't clear on this point, but we checked; it means four full-strength warheads—four times the potential damage. The only drawback is that all four warheads can be shot down as one.

Not Reduced by Range is the same as the beam weapon mod No Range Dissipation. It adds 25 percent to the cost and size of the weapon. This mod can only be used on the Plasma Torpedo, which is practically a beam weapon, anyway.

Overloaded adds 25 percent to the size and cost of a torpedo and 50 percent to the damage. (You can't overload missiles.) Seems fair, but Enveloping is a better bargain on a per-torp basis—if you have room for it. On the other hand, you can fit more launchers for Overloaded torps than Enveloping ones on one ship. Statistically, more will get through to the enemy, which is what it's all about.

BOMBS

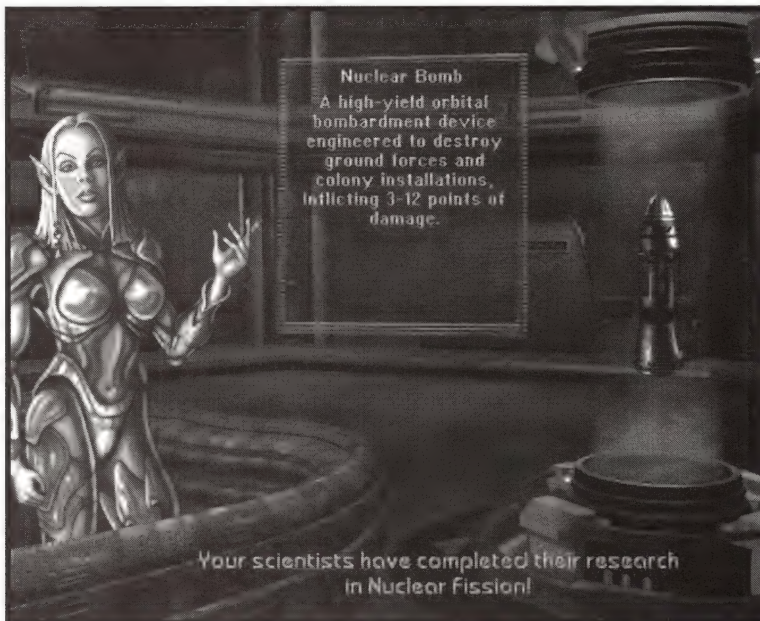


FIGURE 4-18. CAN'T DESTROY COLONIES WITHOUT 'EM.

Bomb weapons are only good for two things—decimating colonies (and ground-based defenses, during combat) and attacking enemy ships. The first use is the one to which you’re most likely to put them, since you must build Bombers into a ship to do the second. If you’re the type who prefers to use the enemy’s resources against him—capturing and assimilating colonies rather than destroying them—you might never use bombs at all.

Bombs are straightforward, like missiles and torpedoes. Better bombs are better bombs, and that’s all there is to it. There are no modifications possible with bombs. You drop ‘em, they go boom.

Here’s the list. Except for the last two—the biologicals—we list the weapons in ascending order by damage.

Table 4-11

Weapon	Damage	Size	Cost	Strategic Damage
Nuclear	3-12	5	3	3-12
Fusion	4-24	7	5	4-24
Antimatter	5-40	7	6	5-40
Neutronium	10-60	10	9	10-60
Death Spores	None ¹	5	5	n/a
Bio-Terminator	None ²	7	8	n/a

1. Has a 10 percent chance of killing 1 unit of population.

2. Has a 20 percent chance of killing 1 unit of population.

FIGHTERS



FIGURE 4-19. THEY CALL THEM "LITTLE HELPERS."

Installing fighters in any of your ships turns it into a carrier. Whether this is a good thing depends somewhat on your style of combat. Fighter craft have some of the same problems missiles do. They must reach the target before they can damage it, and there's a chance for the enemy to destroy them on the way. They're tougher than missiles, however, and tend to make it through more often than not. Unlike missiles, fighters return to the mother ship when they run out of ammo, rearm, refuel, and go out again. Of course, they sometimes get shot at on the way back, too.

Here's the chart. Cost and space are for one installation—a squadron of four fighter craft.

Table 4-12

Type	Speed*	Size	Cost	Hits	Armament	Strategic Damage
Interceptor	10+	30	10	4	1 Beam (4 shots)	1-4
Assault Shuttle	6+	25	15	6	1 Marine	n/a
Bomber	8+	60	30	8	1 Bomb (2 shots)	5-20
Heavy Fighter	8+	80	50	10	2 Bombs & 2 Beams (2 shots each)	8-32

* To the speed of any fighter, add 2 for every drive beyond Nuclear that you've discovered.

Interceptors take the most damaging Point Defense beam weapon you have discovered so far and fire it into an enemy ship four times at point-blank range. That means half damage (because of the Point Defense), but almost no chance of missing and no range penalty at all. It's like two full hits from a standard installation of that beam weapon. Add to this the fact that Interceptors only come in squadrons of four, and they're almost guaranteed to do more damage for the cost and space than the equivalent ship-mounted weapon.

Assault Shuttles are like extensions of your ships; they allow you to board other ships without having to immobilize them and fly up next door. These are possibly the most useful non-Antaran weapons to use against Antarans in the entire game, at least until you get Transporters. Each shuttle squadron carries four Marines over to board the target ship. The ship need not be immobile (as in a ship-to-ship boarding), and the shuttles ignore both shields and armor. Shuttle Marines never raid, but always attempt to capture the ship. If they're successful, that ship is out of the fight. If you win the battle, it's yours.

Bombers are the only method you have of using bombs against ships in combat, and they are automatically armed with the most destructive bomb you've researched. Considering the damage bombs can do, this is nothing to sneeze at. Each squadron of Bombers takes up more space than the largest rack of missiles, but costs no more production than the average rack. For a self-rearming, four-strike bomb attack with no ammunition limits and a better chance of getting through to the enemy, it is quite a bargain. Bombers can also attack planets.

Heavy Fighters are expensive, but worth every bit of space and cost if you're involved in a serious war. If a squadron of these dreadnoughts makes it to the target ship, each of the four craft hits with two of your most destructive bombs and two of your most destructive Point Defense (PD) beam weapons. They stick around for two rounds to do so, then fly home to rearm and do it again. When you're not interested in capturing ships, there's no reason to hesitate over Heavy Fighters.



Tip

Don't forget: If your race is telepathic, you can use captured ships immediately. This makes Assault Shuttles even more attractive.



ODDMENTS

These are all considered weapons systems and selected for installation as such, but they don't fit into any of the standard classifications. Most of them have effects that are fun to watch.

Anti-Missile Rockets (Size 10, Cost 5)

One installation of these carries 20 rockets; that's the ammo limit. They'll fire automatically in defense of the ship they're installed in, or you can aim and fire them yourself. Overall, rockets average about a fifty-fifty chance of destroying an incoming missile. (It's 100 percent, minus 10 percent per square they have to travel to meet the target, plus a random factor.) If you leave them alone to fire automatically, that chance goes way up. When fighting an enemy who frequently uses missiles, rockets are as good as or better than Point Defense beams, and they generally cost less. (In strategic combat, this gives fleets a 50 percent missile evasion bonus.)

Black Hole Generator (Size 150, Cost 150)

This Antaran technology has an enormous price. Against a tough enemy, however, it can be worth it. No matter what the target ship is or has, this weapon destroys it utterly in three combat turns—period. The only way to stop it is to destroy the ship that fired it, or somehow get that ship to move away. That leads us to the main drawback of the BHG (other than the cost): Its range is only 2 squares. Put this one on a ship that is phase cloaked or moves fast in combat; otherwise, you'll never get close enough to use it. (In strategic combat, this does 100 damage.)

Gyro Destabilizer (Size 50, Cost 35)

Grabs any ship within a 15-square range and gives it a spin, doing 3–7 damage per size class of the target ship. That might not seem like a lot of damage for the cost, but consider that it's *all* done directly to the Structural Hits. Plus, the target has a high probability of ending up facing the wrong way to retaliate. Perhaps most important, this one is definitely fun to watch—try it on a Star Base. Too bad it doesn't work on planets! (Strategic damage for this one is 3-8 points.)

Plasma Web (Size 40, Cost 40)

The Plasma Web is pretty and deadly. The amount of damage it does in the first turn is determined when it strikes; it's always between 5 and 25 points—but that's Enveloping damage, which means it's really doing 20–100 points. Every combat turn after that, it sticks to the target and does 5 less damage (20 less, really). When the damage gets to 0 or the target is destroyed, the web disappears. Of course, by then you've fired another one if the target still exists. This weapon costs less than a third what the Black Hole Generator does, but it doesn't hold the target in place. It also doesn't have the range restrictions; Plasma Webs can travel 15 squares. Layering webs is an efficient way to demolish even the most powerful, well-defended enemy fleet.

Pulsar (Size 50, Cost 30)

The Pulsar does between 2 and 24 damage per size class of the ship it's installed in to *every* ship, missile, and fighter within two squares. Sounds great, but this is not a weapon you'd want installed on only a single ship in a fleet. Properly situated, sequentially fired Pulsars can devastate an enemy fleet. The problem is positioning them. The major drawback to this system is its unfortunately short range. Despite its potential as a fleet killer, the Pulsar works best as a defense against enemy fighters and missiles.



FIGURE 4-20. CAPTURED ANTARAN TECHNOLOGY GIVES YOU A SUPREME ADVANTAGE.

Spatial Compressor (Size 50, Cost 40)

This weapon is the Antarans' modified version of the Pulsar. It doesn't affect missiles or fighters, only ships. It does more damage—4 to 32 points per size class of the ship it's installed in—but suffers from the same foreshortened range.

Stasis Field (Size 75, Cost 75)

This isn't really a weapon; it's more like a strategy. With a range of only one square, it can be a dangerous strategy, too. Essentially, the Stasis Field locks a single ship or base out of the battle. (No, it doesn't work on planets.) It's a one-shot weapon, but you only need one shot per ship. It never misses, and the stasis bubble remains intact unless the ship that fired it is destroyed or retreats. (Of course, if you're smart, that ship immediately gets as far from the enemy as possible without leaving combat.) After you've won the rest of the battle, you can release bubbled ships at your leisure and destroy them. This weapon is wonderful for taking the enemy's biggest, toughest ship out of the picture in one fell swoop.

SPECIAL SYSTEMS

After the essentials, weaponry is the first thing that comes to mind for most players when they start designing ships. They install special systems as afterthoughts, in whatever space is left over. In our experience, however, the smart MOO II player does exactly the opposite. Choose the specials you want first, while always keeping one eye on the space that's left, because you do have certain weapons in mind.

Special systems cost more to install in larger ships and take up more space in a larger hull. (Most of them, at least, can be miniaturized like weapons.) We supply all the details in Table 4-13.



System	Cost					
	Sm	Md	Lg	Hg	Ti	DS
Achilles Targeting Unit	10	15	25	50	100	250
Augmented Engines	10	15	25	50	100	250
Automated Repair Unit	10	15	25	50	100	250
Battle Pods	*	*	*	*	*	*
Battle Scanner	10	15	25	50	100	250
Cloaking Device	12	18	30	60	125	325
Damper Field	5	7	12	25	50	125
Displacement Device	10	15	25	50	100	250
ECM Jammer	10	15	25	50	100	250
Energy Absorber	12	18	30	60	125	325
Extended Fuel Tanks	12	18	30	60	125	325
Fast Missile Racks	10	15	25	50	100	250
Hard Shields	10	15	25	50	100	250
Heavy Armor	10	15	25	50	100	250
High Energy Focus	10	15	25	50	100	250
Hyper-X Capacitors	10	15	25	50	100	250
Inertial Nullifier	15	25	40	75	150	375
Inertial Stabilizer	15	25	40	75	150	375
Lightning Field	10	15	25	50	100	250
Multi-Phased Shields	10	15	25	50	100	250
Multi-Wave ECM Jammer	10	15	25	50	100	250
Phasing Cloak	15	25	40	75	150	375
Quantum Detonator	2	3	7	15	30	75
Rangemaster Unit	10	15	25	50	100	250
Reflection Field	10	15	25	50	100	250
Reinforced Hull	10	15	25	50	100	250
Scout Lab	12	20	40	75	150	375
Security Stations	5	7	12	25	50	125
Shield Capacitors	10	15	25	50	100	250
Stealth Field	10	15	25	50	100	250
Structural Analyzer	7	10	18	40	75	190
Subspace Teleporter	10	15	25	50	100	250
Time Warp Facilitator	15	25	40	75	150	375
Tractor Beam	30	30	30	30	30	30
Transporters	10	15	25	50	100	250
Troop Pod	12	18	30	60	125	325
Warp Dissipater	15	25	40	75	150	375
Wide Area Jammer	20	30	50	100	200	500

* Battle Pods *add* 50 percent to the space in a ship.

Size

Sm	Md	Lg	Hg	Ti	DS
15	22	37	75	150	375
5	7	12	25	50	125
10	15	25	50	100	250
20	60	175	400	800	2500
2	5	10	25	60	250
12	18	30	60	125	325
7	10	18	40	75	190
15	22	40	75	150	375
5	7	12	25	50	125
12	18	30	60	125	325
5	10	15	30	60	100
10	15	25	50	100	250
10	15	25	50	100	250
5	7	12	25	50	125
10	15	25	50	100	250
10	15	25	50	100	250
22	40	60	100	225	500
5	7	12	25	50	125
10	15	25	50	100	250
10	15	25	50	100	250
10	15	25	50	100	250
22	40	60	100	225	500
3	5	10	22	45	100
10	15	25	50	100	250
15	22	37	75	150	375
5	7	12	25	50	125
7	12	20	37	75	180
2	3	6	12	25	70
10	15	25	50	100	250
10	15	25	50	100	250
10	15	25	50	100	250
15	22	37	75	150	375
22	40	60	100	225	500
20	20	20	20	20	20
5	7	12	25	50	125
5	7	12	25	50	125
15	25	40	75	150	375
20	30	50	100	200	500

Let's look at the systems one at a time. Most of the specials are combat oriented, of course, since that's what ships are primarily used for. Some combat systems have noncombat effects, and we cover those in the following subsections.

COMBAT



FIGURE 4-21. IT FINDS THE WEAK POINTS IN THE ENEMY SHIPS.

Achilles Targeting Unit adds armor piercing to all beam weapons! (Heavy Armor does not prevent this.) This also triples the chance that those of your weapons that get through the shields will hit enemy weapons and shield generators. Structural Hits and hits on other internal systems are reduced, which means that you're more likely to pull a target's teeth than destroy it. That's a good idea when you're trying to capture ships. This system isn't overly costly, either.

Augmented Engines increases the ship's speed in combat by 5. That, in turn, adds to the Ship Defense. It also gives your ship more mobility. Fast movement in combat is useful if you have short-range weapons onboard and need to get in range; otherwise speed is only a defensive bonus. There are better ways to fill your hull.

Automated Repair Unit repairs 10 percent of the Structural Hits to a ship every combat turn. It also repairs 5 percent of the internal system hits (chosen at random) every turn. This is one handy gadget. Unless your fleet totally outclasses anything you're likely to go up against, this one's worth its weight in BCs.

Battle Pod adds space to the ship for an added cost in production. This is a simple trade-off. If you need the space and can afford the extra cost, by all means go for it. We use them all the time to fit that one, last, absolutely essential special system on board.

Battle Scanner adds 50 percent to a ship's chance of hitting with beam weapons. That's a big increase, and this is the only special system that adds to your chance of hitting with beams. It's worth it if you don't use missiles much. The Battle Scanner has a non-combat effect, too, which we describe in the next subsection.

Cloaking Device provides a 50 percent bonus to the Ship Defense and missile defense (evasion) of the ship it's installed in. (It also has a non-combat effect; we cover this later) That's a big bonus, and well worth it if you have the space.

Damper Field is an Antaran technology. If you install this in a ship, the shields go away. You won't need them. As long as this system is active, three quarters (75 percent) of the damage that gets through to the ship is absorbed by the Damper Field. As with all the Antaran devices, if you've got it, use it. (This system is never miniaturized.)

Displacement Device subtracts 30 percent from every weapon's chance of hitting the ship it's installed in. Not bad for the price, but also not really impressive. There are better ways to defend your ships.

ECM Jammer removes the hit guarantee from enemy missiles aimed at the ship it's installed in. In fact, every missile and torpedo that targets a ship equipped with this system is 70 percent less likely to find its target. Not bad for the price. Of course, it won't divert ECCM missiles as well. That's the problem with this system; it's easily controverted. After the first 50 game turns or so, everyone has ECCM, so spend your hull space elsewhere.

Energy Absorber takes 25 percent of the damage to a ship (before shields and armor) and stores it until that ship's next attack. Then, it fires the energy back at any enemy. Alone or in combination with the Damper Field, this is a winner, though not necessarily worth the cost.

Fast Missile Racks make the missile systems installed in the ship fire twice in one turn, then they fire normally until you have them skip one turn to rearm the fast rack. True, more missiles flying at once means that more get through to the target, but you end up firing the same amount over time. Unless you believe a massive first volley will destroy the target, this system is a waste of space.



FIGURE 4-22. WITHOUT THIS, YOU'RE SHIELDLESS IN A NEBULA.

Hard Shields give you an advantage during battles that take place inside nebulae—your shields work. Those battles are few and far between, though, unless you engineer them. Too bad you can't move a nebula to each world you'd like to attack. The other effects of this system are more useful: it negates a weapon's shield piercing ability, and even after the ship's shields are down, it prevents 3 damage from each successful attack. Don't underestimate that; the savings add up fast.

Heavy Armor cannot be miniaturized. Otherwise, it's not bad in most situations. What this system does is triple the hits the ship's armor can withstand. That's great until Armor Piercing and EMP weapons come along. For the price, this is a system that's useful in the early game, but becomes less and less so as things progress.

High Energy Focus gives you all the good features of a Point Defense modification without the bad. For all beam weapons installed in the ship with it, this system adds 50 percent to the damage each does. On a Medium or Large ship with multiple beams, this is a useful addition. On larger hulls, it's a bit costly until a couple of levels of miniaturization kick in.

Hyper-X Capacitors are the beam equivalent of Fast Missile Racks; these make a ship's beam weapons fire twice in one turn, then normally until they skip a turn. As with the fast racks, unless you're really in love with massive strikes, there are better ways to use your hull space.

Inertial Nullifier is an interesting, effective addition to a ship with beam weapons on board. It completely eliminates the movement cost of turning a ship in place. That makes extended firing arcs pretty much unnecessary, because you can always swivel around to face the target. It's almost always cheaper to install one of these than to add extended arcs to multiple beams. After that, the +75 percent to Ship Defense against beams that this system provides is just gravy.



FIGURE 4-23. LESS EXPENSIVE THAN EXTENDED FIRING ARCS

Inertial Stabilizer is a less expensive, earlier version of the Inertial Nullifier. This one only gives a 50 percent bonus to Ship Defense and halves turning costs rather than eliminating them. It's still useful and still less expensive than multiple extended firing arcs.

Lightning Field costs roughly twice (before taking miniaturization into account) what the Inertial Stabilizer costs, but is one heck of a lot more fun. Whenever an enemy missile, torpedo, or fighter gets within striking range of the ship, the bug zapper turns itself on. There's a 50 percent chance that each incoming projectile or fighter will be destroyed—not damaged, mind you, but totally fried. Worth every BC, this one—unless your enemies only use beam weapons.



FIGURE 4-24. THE MISSILE ZAPPER

Multi-Phased Shields come along fairly early in the middle game, which is good, because otherwise no one would use them. As soon as any race has Shield Piercing weapons available, this system's 50 percent addition to shield strength doesn't count for beans (unless there are Hard Shields on board, too). Before that, however, this is a splendid addition to the defense of any under-gunned ship. If one of your opponents has a lead in offensive technology, a solid defense is your best strategy. Shield strengtheners are generally better and cheaper than armor boosters, since armor doesn't regenerate without help from a repair system.

Multi-Wave ECM Jammer is one of the best defenses against missile and torpedo attacks. This installation subtracts 100 percent from the chance that guided projectiles fired at your ship will hit. The problem is the same as with the basic ECM Jammer: ECCM missiles still aren't always diverted. Of course, by the time you get this system researched, many emperors will have gotten lazy and stopped using the ECCM modification (especially if they read this guide, since we don't recommend them). Still, everyone has ECCM, and they learn fast.

Phasing Cloak makes a ship invisible to the enemy during combat. Sounds useful, doesn't it? It is. The only real drawback is that firing a weapon undoes the cloak. After 10 turns, the Phasing Cloak steps down and works like a Cloaking Device, but most combats are over by then. This system also makes ships undetectable outside of combat.

Quantum Detonator offers an interesting (though not always effective) combat strategy. This Antaran device triples the destructive effect of a ship explosion and gives a ship a 50 percent chance of self-destructing if captured. It's *small* and *cheap*, too. Imagine a fleet of small ships with nothing else on board. Dozens of these jet across the combat space and cluster around enemy ships. A few clicks on the self-destruct option and *bam!*—no more enemy ships.

Rangemaster Unit is less expensive than the High Energy Focus and has a similar effect, but isn't as powerful. This system takes one-third off the range penalties for beam weapons. It's nice enough until you have the High Energy Focus available, but it's nothing special.



FIGURE 4-25. AN INTERESTING ADDITION TO YOUR DEFENSE AND OFFENSE

Reflection Field is pretty awesome, which is why the Antarans use it and you can't research it. This nasty device gives a ship a chance to reflect each beam weapon attack back at the ship that fired it. (The more damage an attack is likely to do, the lower the chance of reflection.) If you've got it, install it in your ships. It doesn't even cost a lot.

Reinforced Hull does a lot for the price. This system triples the Structural Hits and Drive Hits of the ship. It's certainly handy if you've got the space for it. Unfortunately, hulls cannot be miniaturized. Research pretty quickly brings you better options.

Scout Lab has a combat effect only against space monsters. It gives a +10 Ship Attack bonus per size class of the ship it's installed in to *every ship in the same fleet* when they're fighting a monster *or* *Antarans*. This is extremely helpful, especially because you only need to install it in one ship. (If you install it in more than one, the effects are *not* cumulative.) Don't go after space monsters without one. This system also has a useful non-combat effect (we discuss this later).



Note

Multiplayer

Tip: Human opponents are

far more likely to mount boarding actions against your ships than the computer-controlled races. In a multiplayer game, Security Stations take on new value as you struggle to protect both your ships and any technological advantage you might have.

Security Stations add 20 to the defensive rolls of the Marines defending your ships from boarders, and they're relatively inexpensive. So far, so good, but the AI rarely attempts to board your ships. The computer-controlled races depend primarily on espionage and capturing colonies for getting any technologies they don't have. Generally, then, Security Stations aren't worth the trouble.

Shield Capacitors triple the rate at which a ship's shields regenerate. Normally, your shields get 30 percent of the strongest shield's strength back between enemy attacks. If you don't move the ship at all, that climbs to 60 percent. With capacitors, you get 90 percent back each turn even when the ship moves and *120 percent* (three times 30 percent plus the 30 percent bonus for sitting still) when it doesn't. They take up as much space as the average beam weapon, but the capacitors are far more useful. Don't neglect these.

Structural Analyzer is great for disabling ships—but it's much better at destroying them. Whatever beam weapons damage gets through enemy shields hits the armor and internals as usual, but it's all doubled. Whether you want to install this one is a matter of your combat style. It can help, but the Armor Piercing mod does more, and is usually cheaper.

Subspace Teleporter allows you to move your own ship up to 20 squares without actually “moving” for purposes of shield regeneration. This is basically a +20 increase to the speed of your ship. If quick movement in combat is important to you—if you've equipped your ships with Black Hole Generators, for instance—then this system is useful. In our experience, most motion in combat is closing to weapons range, then turning to keep the enemy in your firing arc. An extra twenty squares per turn could really speed the fight up a bit.

Time Warp Facilitator gives the ship it's installed in two combat turns for every one that a normal ship takes. It takes up a lot of space, but this is one killer system. This might even give you a chance against Antarans.

Tractor Beam is interesting. This system allows your ships to trap any ship within four squares and hold it immobile while your fleet pummels it to space dust or Marines board it. There are two drawbacks. The tractorship(s) must remain in range—fewer than four squares from the trapped ship, and the number of beams needed to immobilize a ship is equal to its size class. Still, we like this one; it's more useful than the Stasis Field, but not as much fun as the Gyro Destabilizer.

Transporters are the only way you can guarantee that the Marines on board see any action. Immobilizing an enemy ship so your troops can board and try to capture it is difficult, to say the least. It's much easier to snuggle within 12 squares of the target, knock down a shield,

then beam your invaders over. Considering that they take up less space than the average weapon system, Transporters are a great bargain. They also extend the range from which you can bomb planets during combat, which can be handy against those pesky ground installations.



FIGURE 4-27. THESE ARE NICE FOR BOARDING,
BUT ASSAULT SHUTTLES CAN BE CHEAPER.

Troop Pod doubles the number of Marines on the ship. This is a great thing if you expect to be mounting boarding actions (always a good idea) or defending against them. (See "Security Station" for some extra info.) However, unless you've gotten good at immobilizing enemy ships or have Transporters installed on the same ship, the extra Marines aren't going to see much action. Assault Shuttles come with their own Marines, have a better range, and cost the same no matter what size ship you install them in. Overall, they're a better deal.

Warp Dissipater is the special system of choice for the ruthless type. As long as a ship with this system installed is involved in combat (not yet destroyed), no enemy ship can retreat. This can be important when you're trying to chase down a particular fleet, but they just keep fleeing before you can get any good hits in. Weaker fleets carrying valuable technologies sometimes lead you a merry chase. One dissipater is all it takes. It's just a good thing the Antarans don't have these.

Wide Area Jammer is the best missile and torpedo diverter in the game, for whatever that's worth. The ship it's installed in gets 130 percent protection—which even makes ECCM projectiles go astray. Every other ship in the same fleet gets the 70 percent protection that an ECM Jammer would provide. If you don't know whether your opponents are using ECCM, this is a way to cover your bets, but it's expensive both in cost and space. For the same price or less, you could get one of the nifty special weapons instead.

NON-COMBAT

The special systems that have effects outside of combat are few. Most of them are stealth systems, designed to let you gain an advantage of surprise when you engage an enemy in combat. One or two of these also have effects during combat, and are thus doubly useful.

Battle Scanner increases the out-of-combat scanning range of a ship by 2 parsecs. Your colonies really do most of your scanning, so that might not seem like much—except that scout ships also scan for enemy fleets. That's most often how you find the galaxy's other races. This one also has a combat effect (covered earlier in this chapter).

Cloaking Device makes a ship impossible for enemy long-range scanners to detect. (This effect is wasted against Omniscient races.) That's fine, unless you don't have the cloak installed in *every* ship in the invading fleet. That one sore thumb will show up on scanners as usual, giving your intended target plenty of warning (though it might cause the enemy to underestimate your fleet). The Cloaking Device's combat effect (discussed earlier in this chapter) is somewhat more useful.

Extended Fuel Tank is one of the most useful specials you can install during the early, exploration segment of any game. For a modest cost, you add 50 percent to the range of any ship. This becomes less valuable later, when your research into fuel cells progresses, but it also gives you the option of skipping over a fuel cell technology if there's something else in the same field that you'd rather research. The only real drawback is that research doesn't make it possible to miniaturize the tanks.

Phasing Cloak is the only stealth system with cloaking abilities useful in combat. It makes the ship invisible to enemy ships during combat. Heady stuff, and not overly expensive, either. It also makes ships invisible to enemy long-range scanners, like the Cloaking Device does (with the same limitations). If you're interested in sneaking around (which can be helpful in an extremely competitive galaxy) and you're pretty sure your opponents aren't using Omniscience, this system is extremely useful.

Scout Lab has a combat effect, which we covered earlier in this chapter. As an added bonus, every Scout Lab you install in a ship contributes Research Points (1, 2, 4, 8, 16, or 32, depending on the ship's size) to your empire *every turn*. That might not seem like much, but in science, every little bit helps. In a pinch, you could build a fleet of research laboratories to help with a specific project—or move lab-equipped ships into a specific system to help combat a plague or supernova. The lab does become miniaturized.

Stealth Field is like a weaker version of the Cloaking Device. It makes a ship impossible for enemy long-range scanners to detect, but doesn't supply the combat bonus. (This system has no effect against Omniscient races.) Yes, it's nice to attack without warning, but does it really buy you anything in game terms? Only when the opponent can actually do anything with the advance knowledge of your approach. Plus, if you don't install this system in *every* ship in the invading fleet, what's the point? Our verdict on this one is, "Questionable utility."

WHAT THE AI DOES

Once you know what computer-controlled races you're sharing the galaxy with, it would be nice to know how they're designing their ships. That way, you could design your ships to minimize their strengths and take advantage of weaknesses. Granted, when multiple enemies are running around, you usually can't afford to build specialized ships to post on each border. Still, forewarned is forearmed.

How the AI races design their ships is a bit complicated and, unfortunately for those specialized design ideas, somewhat randomized. Let's start at the beginning.

DESIGN THEMES

At the beginning of every game, each computer-controlled empire is assigned two themes: a ship design theme and a special device theme. Which themes an empire gets depends on the racial attributes and abilities of that race.

Whenever the AI decides to build a ship, it picks a random number from one to 20 ("rolls a twenty-sided die"). Using Table 4-15, it then examines the row appropriate to the race's ship design theme and chooses the ship design type dictated by the roll.

Table 4-14

Ship Design Theme	Standard Beam	Standard Missile	Carrier
Fighter	1	2	3-15
Beam	1-13	14	15
Missile	1	2-14	15
Special	1	2	3

SHIP DESIGN TABLES

The ship design type leads to one of the six design tables (4-15 through 4-20). These detail for each size ship what percentage of the space in that hull is assigned to which type of weapon or device. The AI goes from left to right on this table, filling the first space allocation as fully as possible within the percentage limit. Whatever unused space remains is added to the portion reserved for items from the next column, and so on.

Table 4-15. Standard Beam

Size	Theme Special	Beam Special	Defense Special
Small	0%	0%	15%
Medium	10%	0%	5%
Large	15%	0%	0%
Huge	15%	0%	5%
Titan	15%	0%	10%
Doom Star	15%	0%	15%

Hybrid

16-18

16-17

16-18

4-7

Special Weapon

19

18-19

19

8-15

Special Device

20

20

20

16-20

**Missile (2 Shot)**

0%

0%

10%

15%

15%

15%

Heavy Beam

0%

45%

30%

25%

25%

20%

Beam

85%

30%

30%

25%

20%

20%

Bombs

0%

10%

15%

15%

15%

15%

Table 4-16. Standard Missile

Size	Theme Special	Missile Special	Defense Special
Small	0%	0%	15%
Medium	10%	0%	5%
Large	15%	0%	0%
Huge	15%	0%	5%
Titan	15%	0%	10%
Doom Star	15%	0%	15%

Table 4-17. Hybrid

Size	Theme Special	Defense Special	Missile (5 Shot)
Small	0%	15%	45%
Medium	10%	5%	40%
Large	15%	0%	35%
Huge	15%	5%	35%
Titan	15%	10%	35%
Doom Star	15%	15%	30%

Table 4-18. Carrier

Size	Theme Special	Defense Special	Fighter Bay
Small	0%	15%	85%
Medium	10%	5%	65%
Large	15%	0%	60%
Huge	15%	5%	55%
Titan	15%	10%	45%
Doom Star	15%	15%	40%

Beam	Bombs	Point Beam	Missile (10 Shot)
0%	85%	0%	0%
0%	75%	0%	10%
10%	60%	5%	10%
10%	50%	10%	10%
10%	45%	10%	10%
10%	40%	10%	10%

Heavy Beam	Beam	Bombs
0%	40%	0%
15%	20%	10%
20%	20%	10%
20%	15%	10%
15%	15%	10%
15%	15%	10%

Beam	Point Beam	Bombs
0%	0%	0%
5%	5%	10%
10%	5%	10%
10%	5%	10%
15%	5%	10%
15%	5%	10%

Table 4-19. Special Weapon

Size	Theme Special	Defense Special	Special Weapon	Heavy Beam	Beam	Bombs
Small	0%	15%	60%	0%	25%	0%
Medium	10%	5%	50%	15%	10%	10%
Large	15%	0%	45%	15%	15%	10%
Huge	15%	5%	40%	15%	15%	10%
Titan	15%	10%	35%	15%	15%	10%
Doom Star	15%	15%	30%	15%	15%	10%

Table 4-20. Special Device

Size	Theme Special	Special Device	Defense Special	Heavy Beam	Beam	Bombs
Small	0%	50%	15%	0%	35%	0%
Medium	10%	40%	5%	20%	15%	10%
Large	15%	35%	0%	20%	20%	10%
Huge	15%	30%	5%	20%	20%	10%
Titan	15%	25%	10%	20%	20%	10%
Doom Star	15%	20%	15%	20%	20%	10%



SELECTING WEAPONS AND DEVICES

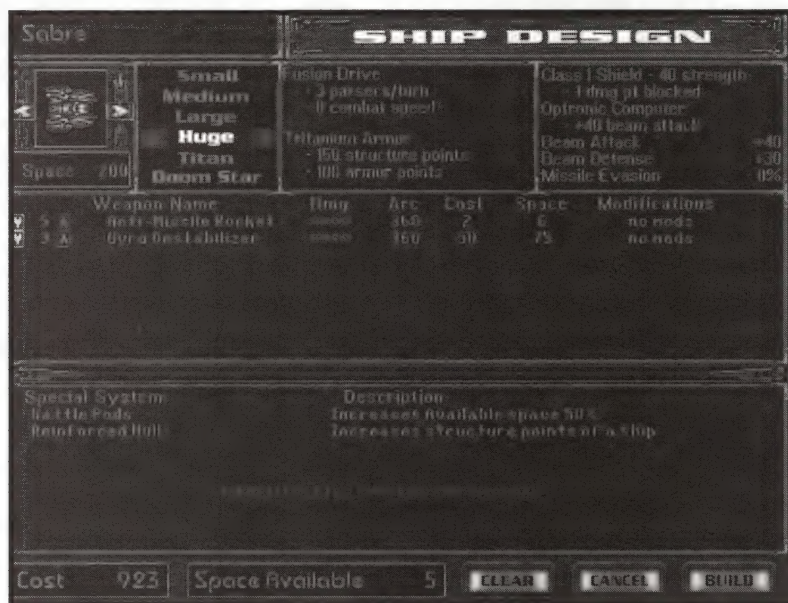


FIGURE 4-29

The question remains: How does the AI choose a weapon or device to fill the allocated space? In the case of the “normal” choices—missiles, beams, bombs, and fighter bay—it simply uses the most advanced that that race has discovered. (For Heavy Beam, the game chooses the most advanced that will fit with the Heavy Mount modification.) For “special” decisions, however, it refers to the associated list.

When selecting from a specials list, the computer-controlled emperor goes down the list *in order*. It chooses the first item on the list that is available—has been researched or gained somehow—and will fit in the space remaining. It installs as many of this item as will fit. If there’s space left, the emperor continues down the list.

One note on the lists: If a listing has two or more choices, the most advanced available to that empire is used.

Theme Specials

There are actually seven Theme Special lists. Remember the special device theme every race was assigned at the beginning of the game? This is where it comes into play. Which list a race chooses from is determined by the special device theme.

Bio-Weapons Theme

Subspace Teleporter
Augmented Engines
Bio-Terminators *or* Death Spores

Capture Theme

Transporters *or* Tractor Beams *or* Assault Shuttles
Troop Pods
Warp Dissipater

Cloaking Theme

Phasing Cloak *or* Cloaking Device *or* Stealth Field

Beam Defense Theme

Inertial Nullifier *or* Inertial Stabilizer
Augmented Engines

Missile Defense Theme

Spatial Compressor *or* Pulsar
Lightning Field
Jammer (Wide Area *or* Multi-Wave *or* ECM)
Anti-Missile Rockets

Armor Theme

Automated Repair Unit
Heavy Armor
Reinforced Hull

Shield Theme

Hard Shields
Multi-Phased Shields
Shield Capacitors

Beam Specials

These are devices that enhance, augment, or amplify the usefulness of beam weapons on the ship.

Time Warp Facilitator
Achilles Targeting Unit
High Energy Focus
Rangemaster Unit
Structural Analyzer
Hyper-X Capacitors
Battle Scanner

Defense Specials

These reflect one area of the game in which the computer players are allowed to know something about your capabilities. There are two lists. Which is selected from depends entirely on your research so far. The decision is based on what you are *capable of building* which has the greatest maximum damage. Okay, it doesn't seem fair, but it's a minor cheat. Look on the bright side. One consequence of this "cheat" is that you know no single AI ship will ever have a Reflection Field *and* a Spatial Compressor (or a Pulsar). Another is that you can foil the AI (in this very minor respect at least) by researching a great weapon, then making a point of using some other weapon type in your ships.

If Your Best Weapon Is Not a Beam Weapon...

Lightning Field
Hard Shields
Spatial Compressor *or* Pulsar
Jammer (Wide Area *or* Multi-Wave *or* ECM)
Augmented Engines
Shield Capacitors
Multi-Phased Shields
Inertial Nullifier *or* Inertial Stabilizer
Anti-Missile Rockets
Heavy Armor
Reinforced Hull
Automated Repair Unit

If Your Best Weapon Is a Beam Weapon...

Reflection Field
Hard Shields
Inertial Nullifier *or* Inertial Stabilizer
Augmented Engines
Shield Capacitors
Multi-Phased Shields
Lightning Field
Heavy Armor
Automated Repair Unit
Jammer (Wide Area *or* Multi-Wave *or* ECM)
Reinforced Hull
Anti-Missile Rockets

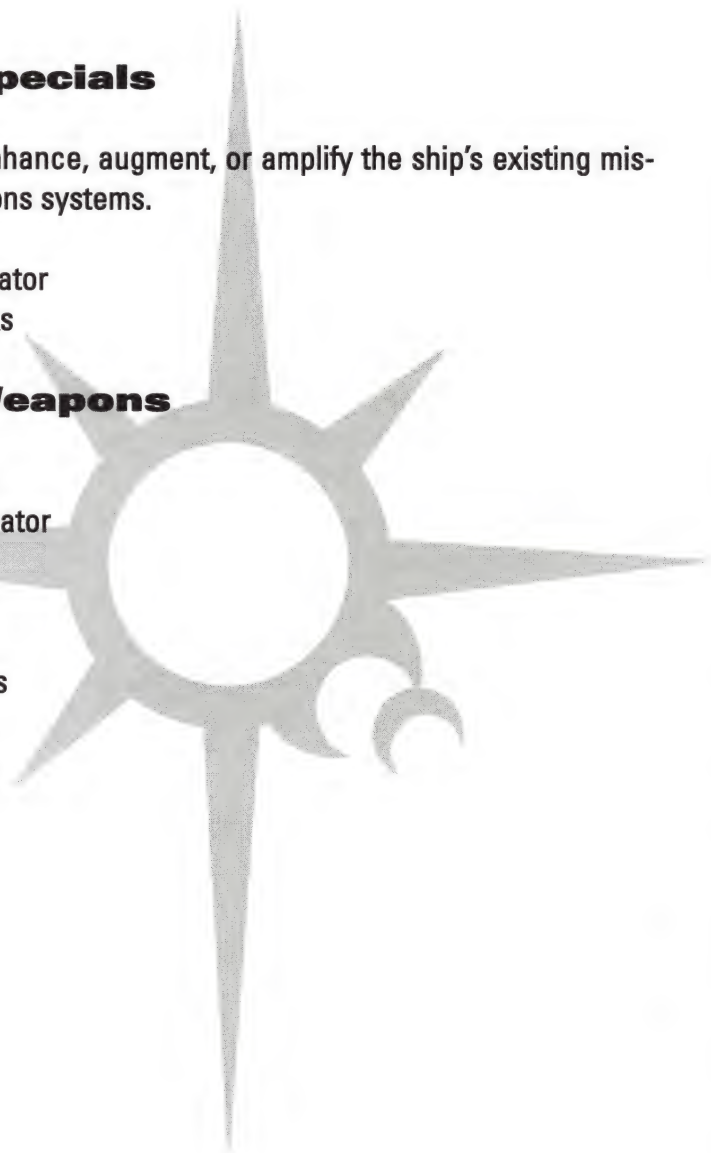
Missile Specials

These devices enhance, augment, or amplify the ship's existing missile-based weapons systems.

Time Warp Facilitator
Fast Missile Racks

Special Weapons

Stellar Converter
Black Hole Generator
Mauler Device
Energy Absorber
Plasma Web
Gyro Destabilizers



Special Devices

Quantum Detonator
Spatial Compressor *or* Pulsar
Stasis Field
Phasing Cloak *or* Cloaking Device *or* Stealth Field
Reflection Field
Subspace Teleporter
Warp Dissipator
Scout Lab





CHAPTER 5

PLANETS AND COLONY MANAGEMENT

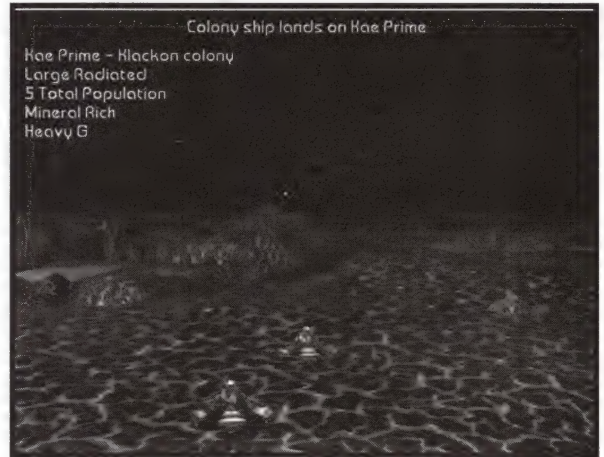


ONE OF MOO II'S MAIN GOALS is to colonize as many planets as you possibly can. The success and failure of the colonies you establish hinge on two key factors. First, the environment of the planet where you build the colony—gravity, size, atmosphere, and prevailing climate—all affect a colony's size and vitality. The first part of this chapter focuses on the layout of the game universe and the types of planets you're likely to encounter when establishing colonies.

The second colony success factor is solely your responsibility—colony management. Once you've picked a new home for your colonists, you must learn what you can do to make sure the colony grows and continues to thrive. Unless you manage your colonies effectively, your game is bound to be very short indeed. That's what the second half of this chapter is all about.

TAKING A LOOK AT THE UNIVERSE

FIGURE 5-1 GENERATING THE UNIVERSE.



You might have noticed that, at the start of every new game, MOO II takes a few moments to generate the universe. What's happening at this point is that the program is "deciding" what types of stars and other phenomena you'll deal with over the course of the game. This is the single biggest and most random element affecting your colonies' success. While you have no control over this aspect of the game, you might as well have a reasonable idea of what to expect to find in the galaxy. You can then use this information to choose logical destinations for your colony ships.

CLASSIFICATION AND DISTRIBUTION OF STARS

The star at the center of each system in the game has a set of identifying characteristics that sets it apart from its neighbors. These are determined by the star's spectral class. Every spectral class is more or less likely to play host to useful planets, and the types of planets depend somewhat on the class, as well. The game features the following stellar types:

- **B (Blue-White):** B-class stars are small and extremely hot. Despite their diminutive stature, they put out more radiation than any other stellar type. Thus, although planets orbiting blue-white stars tend to be very rich in minerals, they're seldom capable of supporting life.
- **F (White):** F-class stars are not much different from the smaller, blue-white variety. The primary factor setting the two types apart is that white stars put out slightly less radiation. Thus, the mineral-rich planets found in orbit around F-class stars tend to be a bit more hospitable to life forms.
- **G (Yellow):** Everyone on Earth should be familiar with G-class stars—after all, we're in orbit around one! (Our sun, of course.) Planets orbiting yellow stars generally have only moderate mineral resource levels, but tend to have good environments for supporting life.
- **K (Orange):** No spectral class has a better chance of playing host to habitable planets than the K-class. Unfortunately, while life-rich, planets orbiting orange stars tend to be mineral-poor.
- **Brown:** Brown Stars are dwarf stars that have either nearly burned out or never had the energy to blossom into a fully formed star. Their low gravity allowed any potential planets and other satellites to escape orbit long ago; however, there's a triple chance of system specials occurring. (See "System Specials" later in this chapter for details.)
- **M (Red):** Red giants are the largest, but coldest, star type. These middle-aged stars have only a small chance of supporting planets at all; when they do, the planets tend to have minimal environments and extremely poor mineral resources.
- **Black Holes:** Although they never have planets, black holes are (technically) stars. More accurately, they're stellar remnants, ancient stars that have collapsed into a tiny sphere so dense it produces awesome amounts of gravity—so much, in fact, that even light can't escape their pull. As a result of the incredible gravitational field, no ship can pass within two parsecs of a black hole.

- **Nebulae:** Like a black hole, a nebula could be a stellar remnant—exploded, in this case; it might also be a birthing ground for new stars. A nebula is a mass of gasses and particles, usually an electrically charged plasma. Such clouds cause nasty ripples in the fabric of hyperspace, limiting ship speed when traveling through a nebula to 1 parsec per turn.



Note

The presence and positions of nebulae

are not a part of the spectral class calculation.

When distributing stars in the galaxy, the game uses a random number generator we'll refer to as a "die roll"—in this case a random number from 1 to 100, inclusive—to determine the spectral class of each star on the map. This system is weighted based on the age of the galaxy you selected. Young galaxies tend to have a greater distribution of small, hot stars, while older galaxies have more medium to large stars. Table 5-1 shows the random number values that generate stars of each spectral class. This calculation is performed for every star placed on the map.

Table 5-1. Distribution of stars by spectral class.

Spectral Class	Young Galaxy	Medium Galaxy	Old Galaxy
B (Blue-White)	1-20	1-10	1-5
F (White)	21-45	11-25	6-10
G (Yellow)	46-55	26-31	11-40
K (Orange)	56-65	32-48	41-61
M (Red)	66-97	49-95	62-91
Brown	98	96-97	92-94
Black Hole	99-100	98-100	95-100

PLANETS AND OTHER SATELLITES

Many, but not all, stars have one or more attending planets and other types of satellites in orbit. As mentioned in Chapter 1, you can establish colonies on any habitable planet within a star system.

All stars, with the exception of brown ones (and black holes, of course), might have up to five orbiting satellites. This number varies according to the star's spectral class. When each star is placed and its class determined, the game uses a die roll (1 to 10) to determine the number of satellites for that star. Table 5-2 shows the number of planets possible for each stellar type.

Table 5-2. Possible number of satellites for each spectral class.

Die Roll	B (Blue-White)	F (White)	G (Yellow)	K (Orange)	Brown	M (Red)
1	1	1	1	2	0	0
2	1	1	2	2	0	0
3	1	1	2	2	0	1
4	2	2	2	3	0	1
5	3	2	3	3	0	1
6	3	2	3	4	0	2
7	4	3	4	4	0	2
8	4	3	4	5	0	2
9	5	4	5	5	0	3
10	5	4	5	5	0	4

Satellite Types

After the game has determined how many satellites each star has, it then calculates the orbital position and type of each satellite. Satellites come in a variety of forms:

- **Planets:** Planets are satellites with a solid surface and environments and sizes that vary widely. Planets are the only type of satellite you can colonize.
- **Gas Giant:** These satellites have an amorphous surface and a thick, toxic atmosphere. Gas giants can't support colonies.
- **Asteroids:** A field of rocks and debris that orbits in a ring around the star. Asteroids are not colonization prospects.
- **Stars:** On very rare occasions, a star might have a companion star orbiting within its system.

Satellites are placed at random in orbital positions numbered I through V, counting out from the innermost position. Although most satellites can occur in any orbit, distribution is weighted to emulate planetary systems observed in nature. For instance, planets usually occur in the innermost orbits, asteroids tend to congregate in the middle orbits, and gas giants are generally found at a greater distance from the star. As with the number of satellites present, a 1-10 die roll determines orbital position and type for each satellite. Table 5-3 shows how the game determines satellite type and position.

Table 5-3. Determining the type and orbital position of satellites.

Die Roll	Orbit I	Orbit II	Orbit III	Orbit IV	Orbit V
1	Asteroids	Asteroids	Asteroids	Asteroids	Asteroids
2	Companion Star (10%)*	Asteroids	Asteroids	Asteroids	Gas Giant
3	Planet	Gas Giant	Asteroids	Gas Giant	Gas Giant
4	Planet	Planet	Gas Giant	Gas Giant	Gas Giant
5	Planet	Planet	Gas Giant	Gas Giant	Gas Giant
6	Planet	Planet	Planet	Planet	Gas Giant
7	Planet	Planet	Planet	Planet	Planet
8	Planet	Planet	Planet	Planet	Planet
9	Planet	Planet	Planet	Planet	Planet
10	Planet	Planet	Planet	Planet	Planet

*The satellite has a 10 percent chance of being a companion star. Otherwise, it's an Asteroid belt.



Note

When a system contains a

companion star, the companion star makes a die roll for spectral class (see Table 5-1). The spectral class of the companion star is always lower than that of the primary star. The presence of a companion subtracts two from the orbital ring for purposes of determining planetary climates within the star system. (See "Planetary Environment and Climate" to better understand this.)

Planetary Size

Once it has set satellite types and positions, the game goes back and assigns a size to every planet (again, using a 1-10 die roll). Table 5-4 shows how this roll determines the size of each world. We also list the "Size Class" associated with each size. This value represents a planet's size in any equation in which size is a factor.

Table 5-4. Determining the size of planets.

Die Roll	Planet Size	Size Class
1	Tiny	1
2-3	Small	2
4-7	Medium	3
8-9	Large	4
10	Huge	5

The following list details planet size characteristics.

- **Tiny:** Planets with equatorial diameters of less than 5,000 kilometers (roughly the size of Pluto or smaller). Tiny planets usually have low gravity, no atmosphere, and little capacity for production and food.
- **Small:** Planets with equatorial diameters of 5,000 to 10,000 kilometers (about the size of Mars). Small planets often have enough gravity to retain an atmosphere, and are generally more conducive to production than Tiny ones.
- **Medium:** Planets with equatorial diameters of between 10,000 and 20,000 kilometers (approximately the size of Earth or Venus). Gravity and environmental conditions are often very similar to the conditions found on Earth.
- **Large:** Planets with equatorial diameters of between 20,000 and 50,000 kilometers (similar to Neptune or Uranus). Large planets have normal to heavy gravity, and above-average productivity potential.
- **Huge:** Planets with equatorial diameters exceeding 50,000 kilometers (the size of Saturn or larger). Although they have the greatest potential for productivity (they support the most production and farms), they're very frequently High-G.

Mineral Resources

Each planet has one of several distributions of minerals. Your colonies use these minerals for production purposes. The amount of mineral wealth found on a planet varies from Ultra Poor (the worst) to Ultra Rich (the best). The more mineral resources a planet has, the more production it can support. The mineral richness of a planet directly affects its density, and therefore its gravity, as well. (See "Planetary Gravity" later in this chapter for details.)

The game randomly determines each planet's mineral rating based on the primary star's spectral class, using yet another 1-10 die roll. Planets orbiting young, hot stars tend to be rich in minerals, whereas planets orbiting older, cooler stars tend to be mineral-poor. Table 5-5 shows the method determining each planet's mineral richness.

Table 5-5. Distribution of planetary mineral richness by star spectral class

Die Roll	B (Blue-White)	F (White)	G (Yellow)	K (Orange)	Brown	M (Red)
1	Abundant	Poor	Poor	Ultra Poor	N/A	Ultra Poor
2	Abundant	Poor	Poor	Poor	N/A	Ultra Poor
3	Abundant	Abundant	Poor	Poor	N/A	Ultra Poor
4	Abundant	Abundant	Abundant	Poor	N/A	Poor
5	Rich	Abundant	Abundant	Poor	N/A	Poor
6	Rich	Abundant	Abundant	Abundant	Abundant	N/A Poor
7	Rich	Rich	Abundant	Abundant	N/A	Abundant
8	Rich	Rich	Rich	Abundant	N/A	Abundant
9	Ultra Rich	Rich	Rich	Abundant	N/A	Abundant
10	Ultra Rich	Ultra Rich	Ultra Rich	Rich	N/A	Abundant

A planet's mineral concentration determines the amount of production each worker can generate per turn. Table 5-6 shows the production limitations for planets of each mineral concentration.

Table 5-6. Base production of workers due to planetary mineral density.

Mineral Resources	Base Production
Ultra Poor	1
Poor	2
Abundant	3
Rich	4
Ultra Rich	5

Planetary Gravity

A planet's gravity affects how your colonists perform their duties. Most races incur serious production penalties if the gravity of a colony world is higher or lower than Normal. In MOO II, a planet can have one of three gravitational strengths:

- **Normal:** Normal worlds have a gravitational pull similar to that of Earth. These worlds have a good chance of possessing an atmosphere, and gravity has no adverse affect on typical colonist productivity.
- **Low-G:** Low Gravity worlds have a gravitational pull less than half the strength of a Normal world's. As a result, they're less likely to have an atmosphere than higher-gravity worlds. The base productivity of typical colonists on Low-G worlds is reduced by 25 percent.
- **High-G:** High Gravity worlds have a gravitational pull at least 1.5 times that of a Normal world. High-G worlds always have some sort of atmosphere, but it isn't necessarily breathable. Base productivity of typical colonists on High-G worlds is reduced by 50 percent.

Two factors affect a planet's gravitational strength—size and density. The number of mineral resources it contains determines planet density. Large planets with lots of minerals tend to be High-G worlds, while small worlds with low mineral concentrations tend to be Low-G worlds. Table 5-7 shows how mineral resources and planetary size combine to determine a world's gravity.

Table 5-7. Determining a planet's gravity strength.

Mineral Resources	Planet Size				
	Tiny	Small	Medium	Large	Huge
Ultra Poor	Low-G	Low-G	Low-G	Normal	Normal
Poor	Low-G	Low-G	Normal	Normal	Normal
Abundant	Low-G	Normal	Normal	Normal	High-G
Rich	Normal	Normal	Normal	High-G	High-G
Ultra Rich	Normal	Normal	High-G	High-G	High-G

Planetary Environment and Climate

Most humanoid life requires certain, very specific conditions to survive. The conditions required to support a humanoid population exist on relatively few worlds. Vegetation, on the other hand, can survive under a much broader spectrum of environmental conditions. In MOO II, each star can potentially be home to up to three planets capable of supporting life (depending on the star's spectral class).

Planetary environments are grouped into four primary categories—bombarded, hostile, life-supporting, and lifeless. A planet's environmental category depends on the spectral class of the system's primary star, planet orbit, and whether or not the planet has an atmosphere. Brighter, young stars, which emit tremendous amounts of radiation, are usually home to hot, irradiated worlds. Old, cool

stars, on the other hand, are more likely to play host to cold, barren worlds. The best chance for life-sustaining planets lies in systems with yellow (class-G) and orange (class-K) stars.

Table 5-8 shows the environmental categories for planets found in each type of star system.

Table 5-8. Environmental categories of planets by spectral type and orbital position.

Spectral Class	Orbit I	Orbit II	Orbit III	Orbit IV	Orbit V
B (Blue-White)	Bombarded	Bombarded	Bombarded	Bombarded	Hostile
F (White)	Bombarded	Bombarded	Hostile	Life Supporting	Lifeless
G (Yellow)	Bombarded	Hostile	Life Supporting	Life Supporting	Lifeless
K (Orange)	Hostile	Life Supporting	Life Supporting	Life Supporting	Lifeless
Brown	N/A	N/A	N/A	N/A	N/A
M (Red)	Hostile	Life Supporting	Lifeless	Lifeless	Lifeless

In addition to a general environmental classification, every planet has a climate. Climate is a vital factor in a wide variety of colony issues, such as population size and growth, food and industrial production, and colony structure maintenance costs.

Every planet has one of the following climates:

- **Radiated:** Radiated planets are constantly awash in stellar and cosmic radiation. They're usually found in the inner orbits and have little or no atmosphere. Because of the detrimental effects of constant radioactive bombardment, the maximum population of a Radiated world is limited to 25 percent of the maximum population of a normal planet of similar size. No food grows on Radiated worlds, and an additional 50 percent accrues to the normal maintenance cost of colony buildings. Constructing Planetary Radiation, Flux, or Barrier Shields can convert Radiated planets to Barren climates. (See "Adjusting Planetary Conditions" later in this chapter for details.)

- **Toxic:** Toxic planets are covered with corrosive materials that quickly eat through almost any material. This doubles the maintenance cost for all colony buildings. In addition, the atmosphere of Toxic worlds is deadly to plant life, making food production impossible. No technology is available to improve of Toxic climates.
- **Barren:** Barren worlds are primarily composed of rock, with little or no soil and very little water. No food grows in such a climate, and colonists are forced to live in enclosed environments. Maintenance of colony buildings increases by 25 percent. Terraforming can improve the climate of barren worlds significantly. (See "Adjusting Planetary Conditions" later in this chapter for details.)
- **Desert:** Although not quite as bleak as Barren worlds, Desert planets suffer a similar lack of water. Food production, while possible, is limited to 1 unit of food per farmer each turn. The frequent sandstorms experienced on Desert planets increase the rate of wear on exposed structures, increasing building maintenance by 50 percent. Desert climates can be improved to Arid status. (See "Adjusting Planetary Conditions" later in this chapter for details.)
- **Tundra:** Tundra planets experience constant subzero temperatures and are thus covered with permafrost all year round. The freezing conditions increase building maintenance by 25 percent and limit food production to 1 unit of food per farmer each turn. Tundra worlds can be transformed into Swamp planets. (See "Adjusting Planetary Conditions" later in this chapter for details.)

- **Ocean:** If there's an opposite to a Desert planet, an Ocean planet is it. These worlds are almost entirely water and have little if any dry land. Food production proceeds at its normal rate, but, due to the need for special living habitats, the maximum population of Ocean worlds is very low for most races. Terraforming can change Ocean planets to Terran climates. (See "Adjusting Planetary Conditions" later in this chapter for details.)
- **Swamp:** Swamp planets are covered with thick, wild vegetation. Food production on these worlds is normal, but the intense, damp heat severely limits maximum population. Like Ocean worlds, Swamp planets can be converted to Terran climate through terraforming. (See "Adjusting Planetary Conditions" later in this chapter for details.)
- **Arid:** Less harsh than Barren and Desert planets, Arid worlds are nevertheless difficult for agriculture (1 food per farmer each turn). The advantage of Arid climates is that they don't suffer the added building maintenance expenses of Barren and Desert worlds.
- **Terran:** Terran worlds have a climate approximating that of Earth, with a variety of weather and terrain conditions scattered throughout the planet. Populations on Terran worlds can grow to 80 percent of the planetary maximum, and food production is excellent (2 food per farmer each turn). Gaia Transformation can change Terran planets to Gaia climates. (See "Adjusting Planetary Conditions" later in this chapter for details.)
- **Gaia:** The Gaia climate is optimum for supporting both humanoid life and vegetation. At 3 food per farmer each turn, Gaia worlds are prime for agriculture. The increased food production capacity allows Gaia worlds to reach the maximum population for a given planet size.

As indicated in the above descriptions, each planet size has a base maximum population influenced by climate type. Table 5-9 shows the maximum population for each planet size and environment.

Table 5-9. Planetary maximum populations.

Climate	Planet Size				
	Tiny	Small	Medium	Large	Huge
Radiated	1	2	4	5	6
Toxic	1	2	4	5	6
Barren	1	2	4	5	6
Desert	2	4	6	8	10
Tundra	1	2	4	5	6
Ocean	1	2	4	5	6
Swamp	3	5	8	10	13
Arid	4	8	12	16	20
Terran	4	8	12	16	20
Gaia	5	10	15	20	25

The only exceptions to Table 5-9's population limits are androids and races possessing special environmental tolerances.

The game assigns climate type to planets in each of the four environmental groupings outlined earlier in this section based on a random die roll of 1 to 100. Table 5-10 shows the method of planetary climate distribution. It also shows the color of the planet's art as it appears in the game and the number of units of food each farmer produces per turn.



Note

If a star system contains a companion

star, subtract two from the orbit number for each planet in that system for Tables 5-8 and 5-9. For example, in a two-star system, Orbit V would be treated as Orbit III when calculating environmental category and climate.

Table 5-10. Distribution of planetary climates.

Climate	Environmental Group					Food per Farmer (per Turn)
	Bombarded	Hostile	Life Supporting	Lifeless	Color	
Toxic	1-15	1-15 (1-5)	1-10 (1-5)	—	Yellow	None
Radiated	16-70 (16-55)*	16-65 (6-35)	11-25 (6-13)	1-20	Purple	None
Barren	71-95 (56-75)	66-85 (36-55)	26-35 (14-21)	21-90 (21-70)	Gray	None
Desert	96-100 (76-100)	86-95 (56-80)	36-45 (22-34)	—	Orange	1
Tundra	—	96-100 (81-100)	46-55 (35-47)	91-98 (71-100)	White	1
Ocean	—	—	56-65 (48-60)	91-100	Blue	2
Swamp	—	—	66-76 (61-73)	—	Brown	2
Arid	—	—	77-87 (74-86)	—	Tan	3
Terran	—	—	88-98 (87-96)	—	Green	4
Gaia	—	—	99-100 (97-100)	—	Bright Green	5

* Numbers in parentheses are used for Old Galaxies

Planetary Summary

Obviously a number of factors make up the “personality” of each planet in the game. Again, the game automatically handles much of the information we present here. There’s certainly no need to memorize it all. You *should* make it a point to know a number of other handy pieces of planet information, however. Table 5-11 summarizes these planetary tidbits.

Table 5-11. Summary of important planetary data.

Planetary Condition	Type	Building Maintenance	Productivity
Climate	Radiated	150%	0 Food/Farmer
	Toxic	200%	0 Food/Farmer
	Barren	125%	0 Food/Farmer
	Desert	125%	1 Food/Farmer
	Tundra	125%	1 Food/Farmer
	Ocean	Normal	2 Food/Farmer
	Swamp	Normal	2 Food/Farmer
	Arid	Normal	1 Food/Farmer
	Terran	Normal	2 Food/Farmer
	Gaia	Normal	3 Food/Farmer
Gravity	Low-G	—	-25% Food and Production
	Normal	—	—
	Heavy-G	—	-50% Food and Production
Minerals	Ultra Poor	—	1 Production/Worker
	Poor	—	2 Production/Worker
	Normal	—	3 Production/Worker
	Rich	—	5 Production/Worker
	Ultra Rich	—	6 Production/Worker

SPECIALS

In addition to all the normal celestial bodies, each star system has a chance of containing one of a number of special items, revealed when you explore the system. A random die roll from 1 to 100 determines whether or not each system contains a system special. Table 5-12 shows the distribution of system specials. Note that brown star systems are three times as likely to contain system specials. However, no planet-based system specials apply, because brown stars have no planets.

Table 5-12. The distribution of system specials.

Die Roll	Special
1-64	None
65-69	Stable Wormhole
70-71	Space Debris
72	Pirate Cache
73-75	Gold Deposits
76-77	Gem Deposits
78-87	Natives
88-91	Splinter Colony
92-95	Marooned Hero
96-100	Ancient Artifacts



Note

In addition to the normal system specials, each star system has a 5 percent chance of being home to a small space monster. "System monsters" are much smaller than wandering space monsters, and they never leave their home star system. Any star system with a system monster *always* contains another system special.

- **Stable Wormhole:** A weakness in the fabric of space that serves as the opening of a subspace conduit allowing instantaneous travel to another wormhole in a connecting star system. Ships can always cross to the other end of a wormhole regardless of distance.
- **Space Debris:** The wreckage of a wrecked spaceship, worth 50 BC.
- **Pirate Cache:** A space pirate's treasure, worth 100 BC.
- **Gold Deposits:** One of the planets in the system contains rich gold deposits. A colony established on this planet generates an additional 5 BC per turn.
- **Gem Deposits:** One of the planets in the system contains rich gem deposits. A colony established on this planet generates an additional 10 BC per turn.

- **Natives:** A humanoid race (not an opponent species, but an independent race) already exists on one of the system's planets. When you establish a colony on this world, you can either kill off the natives or integrate them into your colony. Native populations can only work the farms. They can't be taken off-world to establish a new colony, nor do they gain any special abilities your race possesses. In ground battles, the native population fights at a -10 percent disadvantage.
- **Splinter Colony:** You find a colony built by a group that once broke off from your race. This small colony (population: 3) immediately rejoins your society when discovered.
- **Marooned Hero:** Your race rescues a ship officer or planetary leader who was trapped on one of the system's planets. As an act of gratitude, the hero joins your race without charging an initial hiring fee. (For information about legendary officers and leaders, see Appendix B.)
- **Ancient Artifacts:** You find remains left by an extremely advanced, ancient race on one of the planets in the system. The player who discovers the artifacts first receives an automatic research advance. In addition, science output doubles on the planet where the artifacts are found.

BUILDING COLONIES

Now that you know everything there is to know about how the game creates the universe, it's time to put that knowledge to practical use. In the rest of this chapter, we'll discuss the whens, wheres, and hows of colony building. Then, we'll take a look at what you can do when life on your colonies isn't going quite as planned.



Note

Natives, Splinter Colonies, and

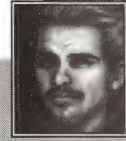
Ancient Artifacts are never found unless there is a planet with one of the following climate types located in the star system: Desert, Tundra, Arid, Ocean, Swamp, Terran, or Gaia.

WHEN AND WHERE TO COLONIZE

As you read through the first half of this chapter, you probably got a pretty good idea of the types of planets best-suited as colony worlds. When should you build new colonies, though, and how many should you build? These tips should help you to decide.

- Don't be in a big hurry to expand. In a Pre-Warp game, you start out with only your home world—you don't have the technology to reach other worlds. You'll quickly overcome the technological hurdles that prevent expansion, however, and before you know it, you're building colony ships. Expansion is the goal of the game, but you needn't start right away. Get the hang of managing the people and resources on your home world before you plunge headlong into expansionism.
- Check your home system first. As a general rule, your home world is the system's best planet, but it's usually not the *only* habitable planet. You should always check the other planets in your home system and see if they have anything of value to offer your society. Although establishing additional colonies in your home system doesn't really expand your empire, the additional resources from the second colony can be quite helpful, not to mention that Colony Bases are less expensive and can be built much more quickly than Colony Ships. As the game progresses, check all of your systems for additional worlds that can support life and add resources to your empire.
- Explore before you commit. Before you send a Colony Ship traipsing off across the galaxy in search of new worlds to plunder, send a Scout Ship to explore the local systems. Not only can Scouts locate the best potential colony planets, they can also warn you of little hazards like space monsters and enemy fleets! It's a lot less expensive to lose a little Scout Ship than it is to lose a Colony Ship. (Of course, if your race is Omniscient, you can skip the whole Scout Ship scenario and just browse through all the systems at your leisure.)

- Stay away from planets with hostile environments, at least at first. In your fervor for expansion, it's tempting to plop a colony down on the first habitable world you come to, regardless of local conditions. Bad idea. This will only cause you hardships you'll have to deal with for quite a while. Until your technology is sufficiently advanced that you can build colony structures to compensate for hostile climates—or you have a good number of colonies that can provide food and population support for the new world—stay away from Radiated, Barren, Desert, Tundra, and Arid planets when possible. We almost *always* avoid building colonies on Toxic worlds, no matter what our level of technology.
- Look for natives. As we indicated earlier in this chapter, some star systems have planets that are home to indigenous beings (who are *not* your opponents). Such planets are a valuable find. While the natives can't leave the world and don't contribute to either industrial production or scientific research, they *do* work the fields for you, producing food for the colony. This frees up your colonists for production and science duties. Colonies with native populations tend to get off to a faster start.
- Sometimes, an outpost will do. One problem with your early expansionist efforts is that your ships' range is extremely limited. (Remember, your ships can't travel farther than their maximum range from any system you control.) It's often a catch-22 situation: There are no suitable planets on any of the systems within your ships' range, but you must control more systems to extend your range. Well, rather than establish full-blown colonies on less-than-perfect worlds, build outposts instead. Outpost Ships are much less expensive than Colony Ships, and outposts work just as well as colonies when it comes to extending ship range. Plus, because outposts are automated, they suffer no penalties when established on hostile worlds. (Of course, they don't produce anything—but they often make it possible for you to reach systems where you can build colonies that do!)



Note

According to the numbers, orange and yellow stars have the best potential for being home to planets with hospitable climates. In practice, we've seen quite a few orange and yellow star systems with *no* habitable planets. Still, as a general rule, the numbers don't lie. The odds favor starting your explorations in orange and yellow systems—if you have any close by.



Tip

One key to a successful empire is balance.

Throughout this chapter you'll note that different planetary climates are conducive to different tasks. It's extremely rare that you'll ever find a planet that's both Ultra Rich mineral-wise and possesses optimum climate conditions for farming. Therefore, you shouldn't try to make all of your colony worlds multifunctional. Take colonies that are Ultra Rich in minerals and make most of their population into workers. Those planets can be industrial colonies that build your biggest, most expensive starships. To support your industrial worlds, establish colonies on planets that allow lots of food production and assign their colonists to farming tasks. As long as Freighter Fleets are available, the excess food in the agricultural colonies will support the colonists on the industrial colonies. If you find a world with the Ancient Artifacts special or conquer a planet belonging to a race with superior research abilities, turn that world into a science planet. We're not suggesting that *all* your planets need to be specialized; we've just found that when you have a large empire, this system of diversification tends to work extremely well.

ESTABLISHING A NEW COLONY

Once you locate a system with a suitable planet and your Colony Ship arrives, all you have to do is click on the planet you want to colonize. When you do, the Colonial Statistics box appears (Figure 5-3). This box serves two purposes. First, it gives you a summary of what you can expect of a colony established on the chosen world. It shows the following statistics:

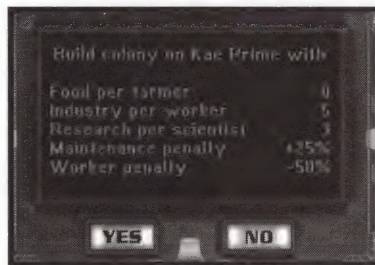


FIGURE 5-3. THE COLONIAL STATISTICS BOX.

- food per farmer;
- industry per worker;
- research per scientist;
- colony structure maintenance penalty; and,
- worker penalty.

The planet's environment determines all these factors. These are the "base" numbers, and in many cases you can improve them by constructing certain colony structures and through terraforming. We discuss the improvement of planetary and colony conditions later in this chapter.

The second thing the Colonial Statistics box provides is the opportunity to change your mind: If you don't want to build a colony on the planet after all, just click "No."

COLONY MANAGEMENT



FIGURE 5-4. THE COLONY SCREEN.

It's an unfortunate fact of life that worthwhile things rarely come easy. If you're a player of the original *Master of Orion*, you might bemoan the fact that you have a lot more to do in the way of colony management in MOO II. Well, take heart! It's not really as bad as it seems. After a little initial effort, colonies eventually get to the point where they *almost* run themselves.

THE COLONIAL INFRASTRUCTURE

Unlike many games, in which all your production centers are more or less on their own as far as generating resources is concerned, your MOO II colonies are connected by a sort of invisible infrastructure. It is, in fact, so invisible that you might not even know it's there. It's this symbiosis between your worlds that eliminates a lot of the tedious micromanagement you find in so many strategy games.

While industrial production is specific to each colony, your colonies share the other four main resources—money, food, science, and population. Money and science sharing are obvious—they happen automatically, without any effort on your part. Population sharing you've probably figured out: Just build a Freighter Fleet, and transport colonists back and forth between any of your colony worlds.

But what about food? When you're new to the game, food sharing can be a frustrating thing. According to the Freighter Fleet description, it can carry either one unit of population or five units of food from one colony to another. Loading the people is easy—drag and drop. But you can't drag and drop food. So what do you do when you want to take food to another colony?

The answer is nothing. This is the most invisible part of the colony infrastructure. Colonies suffering a food deficit automatically receive enough food to feed their populations from colonies producing excess food—*provided you have enough Freighter Fleets to transport the food*. For example, Colony A has a food deficit of 3 each turn, while Colony B has a food surplus of 5. If you have at least one Freighter Fleet in operation anywhere in your empire, three units of food are automatically ferried from Colony B to Colony A each turn to remedy the problem. This transaction often goes unnoticed by beginners who've built Freighter Fleets just to transport colonists.

The only way to monitor food transfer activities is to look at the Freighters indicators on the main screen and the Colonial Overview. If you have insufficient Freighters in service to ferry all the food required each turn, a negative number shows the number of Freighters you need to reach status quo. In the foregoing example, if Colony A had a food deficit of six but only five Freighters (one Freighter Fleet) were available to transport food, five units of food per turn would be transferred to the underprivileged colony, leaving a deficit of 1 food per turn in Colony A.

ADJUSTING PLANETARY CONDITIONS

Among the factors that have the most widespread effects on the operation of a colony are the climate and gravity of the colony world itself. While many small things can affect one aspect of colony management, such as food or production, climate and gravity affect virtually every aspect of colonial productivity.

Again, avoid the more hostile climates until you have the technology to beat the odds. Once you have the technology, you can mold just about any environment (except Toxic) to better suit your colony's needs.

Table 5-13 lists all the colony buildings and achievements that allow you to change the climates of colony worlds.

Table 5-13. Buildings and achievements that change planetary climate.

Building/Achievement	Technology Required	Effect
Artificial Planet Construction	Advanced Manufacturing	Creates a habitable planet from an Asteroid Field or Gas Giant in the same system
Gaia Transformation	Trans Genetics	Changes a Swamp, Arid, or Terran world to Gaia
Planetary Barrier Shield	Temporal Fields	Converts Radiated worlds to Barren worlds
Planetary Flux Shield	Quantum Fields	Converts Radiated worlds to Barren worlds
Planetary Gravity Generator	Artificial Gravity	Eliminates the penalties of Low- and High-G planets
Planetary Radiation Shield	Magneto Gravitics	Converts Radiated worlds to Barren worlds
Terraforming	Genetic Mutations	Converts a planet's environment to the next most hospitable climate type

POPULATION



The heart of your colony is its population. After all, the colonists comprise most, if not all, of each colony's workforce of farmers, workers, and scientists. The proper care and feeding of your people is the key to running successful colonies.

Population Growth

As we demonstrated earlier in this chapter, a colony's maximum population depends on planetary conditions. When you establish a new colony on an uninhabited world, its population is 1. Population growth depends (generally) on the amount of food the colony produces: Each colonist requires one unit of food each turn. As long as these needs are met, and there's potential to grow more food, the population grows steadily. The population growth rate depends on planetary environment (more hospitable environments equal faster growth), population size (greater population equals faster growth), and the race you play (some races have inherent bonuses or penalties to their population growth).

The formula used to calculate the base rate of population growth each turn is pretty complex, and might be hard to follow, but here it is:

$$\text{Base Population Growth} = \text{isqrt} \{ [(\text{Limit} - \text{Total Population}) \times \text{Current Population} \times 2000] \div \text{Limit} \}$$

where Limit = the maximum population for a given race on the planet in question; Total Population = the entire population of the colony, including natives and androids; Current Population = the number of units in the race whose growth is being calculated, and isqrt = integer square root.

After calculating the base growth rate for each race present, the game takes the following population growth modifiers into account:

- Food Shortage: -50 for each unit short (-25 for each half-unit short for Cybernetic races)
- Racial Bonus: varies depending on race
- Medical Leader Bonus: bonus depends on leader's skill
- Population Boom: +100



Note

Note the distinction between

"Total Population" and "Current Population."

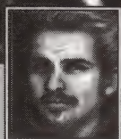
Because each race grows at its own rate, this equation must be calculated for each race present on the planet. The population growth number at the top of the Colony screen is the sum of the growth rates of all races present in the colony.

- Plague: -200
- Microbiotics: +25 percent (not cumulative with Universal Antidote)
- Universal Antidote: +50 percent (not cumulative with Microbiotics)
- Housing Bonus (each Housing building present): $(40 \times \text{Total Production}) \div \text{Total Population}$
- Once the modifiers are totaled, the following equation determines the actual population growth for the current turn for each race present:

$$\text{Actual Growth} = (\text{Base Population Growth} \times \text{Total of Modifiers}) \div 100$$

Once all calculations have been performed, Actual Growth figures for each race present in the colony are added together to determine colony growth rate for the turn.

Colonist icons represent your planet's working population (Figure 5-5). Each icon represents an unspecified number of beings. (A unit originally was supposed to be a million colonists, but that would mean planets with a maximum population of less than New York City, which seemed pretty silly.) Each time the planet accrues another million population growth points, a new Colonist icon appears. The Colony screen displays the exact population score of the colony (in thousands of points) in the upper right corner, below the Colony Growth rate. Early in a colony's existence, it takes quite a number of turns to increase the population.



Note

The Cloning Center adds +100 to the rate of colony growth after all modifiers are taken into account.



FIGURE 5-5. YOUR COLONISTS AT WORK.

Growth in a New Colony

Assuming you've followed our advice on choosing your colony sites wisely, all your colonies have an excellent chance to experience steady growth. However, some colonies—especially those established on less-than-hospitable worlds—often need a jump-start to get going. That's where population transfers come in.

The first thing you want to do in a new colony is start to develop it—build new buildings, add scientists to research, etc. Problem is, when you establish a new colony you only have one unit of population to work with for a while. That means that, in most cases, this lone colonist unit is forced to work in the fields just to produce enough food to survive. That means population growth but *no production*.

Our favorite strategy when a new colony comes on line is to transport a unit of population to it from an established colony. Assuming one farmer can generate enough food for two colonists (and, on most hospitable planets, this is the case), you can assign the newly transplanted colonist unit to production. This allows you to start building stuff.

Fixing Food Shortages

As mentioned earlier, steady colony growth depends on producing enough food to feed the colonists that live there, and the potential to grow more food for future members of the population.

The Food line of the Colony screen's Yield section displays food deficits. As described in the manual, a dark-colored corn or grain bag icon represents a shortfall in food production. Again, your Freighter Fleets automatically transport food from colonies with a surplus to those with a food deficit, up to the capacity of the available Freighters. This helps keep your people from starving; however, if there's no possibility of producing additional food on the colony itself, there can be no population growth.

There are a couple of ways to correct a colony's food deficit:

- Draft some farmers. Removing colonists from industry and/or science duty and putting them to work on farms is the most obvious way to deal with a food shortage. In most cases, this is usually sufficient until the colony tops its next million, accruing another Colonist icon. Of course, removing workers reduces the colony's production, and removing scientists decreases the number of research points (RPs) the colony produces.
- Build colony structures. This is a better long-term solution to food problems than constantly shifting your colonists from job to job. As your research progresses, you have the opportunity to gain knowledge of a number of buildings and colony improvements that increase the amount of food the colony produce. Table 5-14 lists these buildings and their effects.

Table 5-14. Colony buildings that increase food production.

Building/Improvement	Technology Required	Effect
Android Farmers	Cybertechnics	+3 food per turn
Astro University	Advanced Teaching Methods	+1 food per farmer per turn
Biomorphic Fungi	Trans Genetics	+1 food per farmer per turn*
Food Replicators	Matter-Energy Conversion	Industry converted to food on a 2-for-1 basis, as needed
Hydroponic Farm	Astro Biology	+2 food per turn
Soil Enrichment	Advanced Biology	+1 food per farmer per turn**
Subterranean Farms	Macro Genetics	+5 food per turn
Weather Control System	Macro Genetics	+2 food per farmer per turn

*On planets that normally produce no food, food production becomes 1 per farmer per turn.

**Soil Enrichment doesn't work on Barren, Radiated, or Toxic planets.

Note that buildings and processes that improve a colony's climate and/or gravity conditions might also improve food generation. Table 5-13 lists climate and gravity improvements.

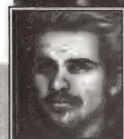
Do You Want to Grow Faster?

Sometimes you just don't have the luxury of being able to sit around and wait for your colony to grow at a normal rate. If this is the case, you have some options open to you—in the form of colony buildings and scientific achievements that increase the rate of population growth. Table 5-15 lists these.

Table 5-15. Buildings that increase the rate of population growth.

Building/Achievement	Technology Required	Effect
Cloning Center	Advanced Biology	Increases population growth by 100,000 per turn
Microbiotics	Genetic Engineering	Increases population growth by 25% per turn in all colonies
Universal Antidote	Artificial Life	Increases population growth by 50% per turn

*The effects of Universal Antidote are *not* cumulative with Microbiotics.



Note

The earliest technological method of

increasing a planet's food output is the Hydroponic Farm. This should always be the first thing you build on a new colony world—period. In fact, it's so helpful that we usually buy this building the turn the new colony comes on line. That way, on the second turn of your colony's existence, it's already producing enough food for two units of colonists—without having to assign *anyone* to farming detail. This means plenty of food and a good jump on early production in the colony. Do yourself a favor. Buy the Farm.

As we mentioned, there's also one other "quick and dirty" way to increase colony population: Populate it with colonists from some *other* colony. You can pick up any number of colonists and place them on the Transport Colonists line on the Colony Display. Assuming you have enough Freighter Fleets to transport them (one fleet is required



Note

You should be aware of two drawbacks to transporting colonists between colonies. The first is obvious: While the personnel transfer increases the population and production of the destination colony, the population and production of the source colony *decreases* proportionally. Make sure the source colony can stand the loss before you commit to this course of action.

The second drawback is less obvious. Take care not to overload the destination colony. That is, don't send so many colonists that you exceed the destination planet's maximum population. Usually, you're notified if you're transporting too many people. Unfortunately, the game doesn't take travel time into account. For example, you're transporting three colonists from Colony A to Colony B. The maximum population of Planet B is 10, and there are currently seven colonists there. No problem, says the game; transport away. During the trip, however, there's a population increase from seven to eight on Planet B. When the colonists arrive at their destination, two units are added to Planet B's population, increasing it to the planetary max of 10. The other transplanted population unit? It disappears. Gone. Kaput. Always check the population *and* the growth rate of a destination planet before you send colonists there.

for each population unit), these colonists are then transported to the colony of your choice. If a quick increase in population—and, thus, production—is what you require in any colony, this is certainly the fastest way to take care of the situation.

All Maxed Out and Nowhere to Grow

So you've managed to solve that food deficit problem, you've boosted population growth to incredible levels, and your colony has reached the planetary maximum for population. Now what? Well, you could accept the limitations of your colony world, or you could do something to improve the planet's life-support capacity.

Aside from special racial abilities, the only way to increase the population potential of your colonies is by constructing special buildings. Table 5-16 lists the buildings and improvements that increase a colony's maximum population.

Table 5-16. Buildings that increase planetary maximum population.

Building/Improvement	Technology Required	Effect
Advanced City Planning	Superscalar Construction	Increases planetary maximum population on <i>all</i> colonies in the empire by 5
Biospheres	Astro Biology	Increases planetary maximum population by 2

Note that buildings and processes that improve the climate and/or gravity conditions of a colony might also increase planetary maximum population. Table 5-13 lists climate and gravity improvements.

Natives and Conquered Aliens

As you set off on your spree of galactic conquest, you'll find that not all the planets you want to colonize are uninhabited. Some planets have native populations; others have been colonized by other players. Since these indigenous beings behave uniquely, they're worth mentioning.

"Native populations" are beings (*not* your opponents) who already occupy the planet you've chosen to colonize. Natives are useful in that they provide free labor for your colony. They can't leave the planet, take part in industrial production, or help with research, but they do produce food. This frees up your people for other tasks. They also pay taxes—and a little extra money never hurt anyone.

Natives don't benefit from any special modifiers your race enjoys. For example, natives on a Klackon colony don't receive the Klackon's +1 food production bonus. The only thing natives do other than till and harvest is defend their world. But, as with other abilities, the native population receives no racial modifiers for ground combat.

The alien populations remaining in enemy colonies you conquer have their own set of advantages and disadvantages. Unlike native populations, alien survivors can work at any task—farming, production, or research. However, until your society assimilates them, the aliens work at 50 percent of their normal efficiency.

When it comes to special abilities, the aliens retain all their racial attributes. These special abilities (and *disabilities*) apply to the captured colony *only*. They don't carry over into your empire as a whole.

MORALE

As if keeping your colonists fed and their numbers growing steadily weren't enough, you're also expected to keep them happy. The morale rating represents the general happiness of a colony's population. A few factors affect it, including your system of government and the presence of certain colony buildings. The strain of having two races coexist on the same world adversely affects morale in captured colonies.

The top box in the Population section of the Colony screen displays Colonist Morale level (Figure 5-6). Smiling icons represent the level of overall happiness, and frowning icons stand for an overall sense of unhappiness. Every happy face represents a 10 percent production bonus for the colony, and every sad face represents a 10 percent penalty. Morale, good or bad, does not affect Androids.



FIGURE 5-6. COLONY MORALE.

Dealing with morale problems midgame usually comes down to building structures that make your people happy. Table 5-17 lists the buildings you can add to a colony to improve morale.

Table 5-17. Buildings that improve morale.

Building	Technology Required	Effect
Alien Management Center	Xeno Relations	Eliminates the morale penalty of multiple races coexisting on captured colonies
Armor Barracks	Astro Engineering	Increases morale under certain governments*
Holo Simulator	Positronics	Increases the planet's morale by 20%
Marine Barracks	Engineering	Increases morale under certain governments*
Virtual Reality Network	Galactic Networking	Increases the morale of <i>every</i> colony in your empire by 20%

* Colonies under both Feudal governments and Dictatorships receive a -20% morale penalty unless they have an Armor or Marine Barracks.

INDUSTRIAL PRODUCTION

Icons just below the food line on the Colony screen represent the amount of industrial production the colony generates. Every colonist assigned to industry (a "worker") generates a number of units of production each turn. The amount each worker produces depends on planetary conditions, racial modifiers, and technologies. Each right-leaning pickax represents one unit of production; each right-leaning pickax next to a dirt pile represents 10. (See Figure 5-7.)



FIGURE 5-7. MONITORING INDUSTRIAL PRODUCTION



Tip

In Feudal Governments and Dictatorships,

that morale penalty on all your colonies prior to building a Marine Barracks can snowball into a sizable production hit if you don't do something about it. That's why one of the first things you should build in a new colony is a Marine Barracks. In fact, it should be second only to the Hydroponic Farm in order of building priority. It's always best to eliminate the penalty while it's just a nuisance, rather than waiting until it's a major vexation.

A healthy amount of industry is essential on every colony; the more units of production the colony generates, the faster it can build things—plain and simple. Unlike food, it's impossible to have a shortfall of industrial production, but you feel the effects of low industry levels just as keenly as—or even more keenly than—starvation.

Industry is particularly difficult to deal with in newly established colonies. The first colonist is always assigned to farming duties (when applicable). This provides your new colony with sufficient food, but *zero* production. A good way to fix an early lack of production is to transfer colonists from an established colony to the new one and allow them to take over production duties on the new world until the population grows.

In addition to moving colonists to a new colony, you can also make certain additions to a colony planet to increase worker efficiency and thus the colony's production rate. Table 5-18 lists the buildings and advances that increase production.

Table 5-18. Buildings and advances that increase industrial production.

Building/Advance	Technology Required	Effect
Android Workers	Cybertechnics	+3 production per worker*
Astro University	Teaching Methods	+1 production per worker per turn
Automated Factories	Advanced Construction	+1 production per worker per turn
Deep Core Mining	Tectonic Engineering	+2 production per worker per turn
Microlite Construction	Nano Technology	+1 production per worker per turn on all colonies you control
Recyclotron	Advanced Manufacturing	+1 production per colonist per turn**
Robo-Mining Plant	Robotics	+2 production per worker per turn
Robotic Factory	Advanced Robotics	+15 production per turn

* Android Workers consume one unit of production each per turn rather than one unit of food.

** Note that the Recyclotron adds +1 production for every *colonist*, not just for every worker.

This additional production doesn't count toward the planetary pollution level.

Buildings and processes that improve a colony's climate and/or gravity conditions might also increase production. Table 5-13 lists climate and gravity improvements.

Dealing with Pollution



So, now you've solved that slow production problem, and your workers are generating more production than you ever could have hoped for. Great! Now for the bad news ...

Production generates pollution. Every planet can handle a certain amount of production before pollution starts to become a problem. This is the planet's "Pollution Tolerance." Pollution Tolerance is determined as follows:

$$\text{Pollution Tolerance} = \text{Size Class} \times 2$$

For example, medium planets (size class 3) have a Pollution Tolerance of 6.

Once a colony generates more production than the planet's Pollution Tolerance allows, a certain amount of the production generated each turn is automatically used to clean up the excess pollution also being generated. Toxic-waste-barrel icons represent production used for this purpose on the production line of the Colony screen. This, of course, has a negative impact on your production. As you produce more pollution, more production is rerouted from building projects to pollution cleanup. The amount of production required for pollution cleanup each turn is determined as follows:

$$\text{Production Required for Cleanup} = (\text{Total Colony Production} - \text{Pollution Tolerance}) \div 2$$



Note

Example: A medium planet generates 10

units of production per turn (four more than the planetary Pollution Tolerance of 6). Using the above equation, you can see that two units of production each turn— $(10 - 6) \div 2$ —is used to clean up pollution. In other words, although the colony's workers generate 10 units of production each turn, only eight units are available for use in building projects.

Obviously, you must address this situation before the drain on your production becomes critical. You can opt to generate an amount of production equal to or less than the Pollution Tolerance on each of your colonies, but this could be more limiting than putting up with pollution. Obviously, abstinence is not a viable solution. Luckily, a number of buildings and advances help alleviate the pollution problem. Table 5-19 lists these.

Table 5-19. Buildings and advances that reduce pollution.

Building/Advance	Technology Required	Effect
Atmospheric Renewer	Molecular Compression	Reduces Total Colony Production by 75% for purpose of calculating Production Required for Cleanup
Core Waste Dumps	Tectonic Engineering	Eliminates All Pollution on the Planet
Nano Disassemblers	Nano Technology	Doubles a Planet's Pollution Tolerance
Pollution Processor	Advanced Chemistry	Reduces Total Colony Production to 50% for purpose of calculating Production Required for Cleanup

In addition to the foregoing improvements, one of the production-enhancing buildings in the game, the Recyclotron, has environmental benefits, as well. The additional production generated by this building does *not* count toward Total Colony Production for the purpose of calculating pollution.

Buying Production

If you follow all the production guidelines and suggestions we've given you, all your colonies should be producing buildings, spaceships, and other items at a steady rate. At this point, all you have to do is fill up your production queue and wait for the goodies to arrive. Unfortunately, you don't always have time to wait for production to be completed; you just *have* to finish a starship to rout an impending invasion, for instance. In cases like this, you have the option to use money from your treasury to pay for project completion.

Each item you build requires a certain number of production units to complete (as the manual explains). When you opt to pay for project completion, it costs a certain number of BCs per production unit remaining in the item's cost. The amount paid per production unit varies with the percentage of the item's completion. Table 5-20 details this.

Table 5-20. Cost in BCs to buy the completion of a production item

Percentage of Item Completed	Cost Per Production Point
0-10%	10 BC
11-50%	5 BC
51-100%	2 BC

To better understand how this works, let's take an example: You order a colony to begin production on a Hydroponic Farm costing 60 production units to build. No production has been allocated yet. Instead of waiting, you elect to buy the building outright. The total cost to buy the Farm is calculated as follows:



Tip

Colony buildings providing an increase of planetary Pollution Tolerance tend to be more effective at solving pollution problems than those that artificially reduce Total Colony Production. If you have the technology, Nano Disassemblers are the way to go. Used in tandem with an Atmospheric Renewer, these should pretty much eliminate any planet's pollution problems. Of course, once you can build Core Waste Dumps, pollution becomes a moot point.



Note

If you have insufficient funds in your treasury to buy an item, the Buy buttons on the Production screen and Colonial Overview are inactive.

- The first 6 production units (10%) cost 10 BC each (60 BC total).
- The next 24 production units (11-50%) cost 5 BC each (120 BC total).
- The last 30 production units (51-100%) cost 2 BC each (60 BC total).
- The grand total cost for buying the Hydroponic Farm is, therefore, 240 BC.

As you can see, the cost of an item decreases significantly as more of it is completed. If the same Hydroponic Farm were purchased after its production was 10 percent complete, the purchase price would be only 180 BC, and so on.



MONETARY PROBLEMS

Money. In MOO II, as in real life, there never seems to be enough of it.

In the game, two primary sources generate the stuff—taxes and commerce. The income generated from all sources is pooled together. We'll refer to the money collected each turn as "gross income." Your colonies receive funds from this to pay building maintenance costs. If you have any colony or ship leaders in your employ, they receive their salaries from this gross amount as well. Finally, if necessary, some of this money is also routed to your space fleet to pay *their* maintenance costs. (See the following "Maintenance Costs" section for details on colony and ship maintenance.) If there's any money left over after paying all maintenance costs (*net* income), it goes to your treasury. If you're not generating enough money to cover your expenses, the difference is subtracted from your treasury (a net loss). The monetary surplus or deficit displays as a positive or negative number in the Treasury indicator on the main screen.

Taxes

In *Master of Orion II*, every citizen of your empire pays taxes. Taxes are normally generated at the rate of 1 BC per point of population each turn (assuming a Tax Rate set at zero percent). For example, a colony with a population of eight generates 8 BC per turn in taxes. A racial bonus in the money category can increase this amount by .5 or 1 BC per population point, while a penalty in this category reduces the amount collected by .5 BC per population point. Buildings added to your colonies also can increase the amount of tax money you collect from each population unit. Table 5-21 lists these, along with other money-enhancing items (under the "Commerce" section, later in this chapter). Your gross income accrues the money taxes generate, as it does all other game-generated funds.

As with any empowered emperor, you have the authority to raise taxes as necessary to bolster your empire's economy. As the tax scale in Figure 5-8 indicates, you can set your taxes from zero to 50 percent.

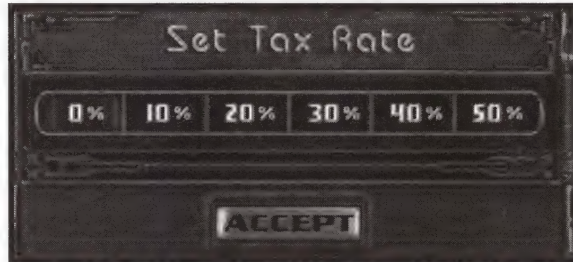


FIGURE 5-8.
RAISING TAXES



Tip

The only time you might want to raise

taxes to extremely high levels is when you need money to complete a number of construction projects quickly. Temporary bouts of insane taxation can fill the coffers quickly. Just remember to set the taxes back to reasonable levels (preferably 0, if possible) when you're done.

This scale doesn't mean what you might think. The default setting is "0%." This doesn't mean your people aren't paying taxes; it means there's been no tax increase, and your people are paying taxes at the normal rate of 1 BC apiece per turn. The percentages from 10 percent to 50 percent represent the percentage of production in *all your colonies* that's to be converted into additional tax money.

The way MOO II handles taxation makes raising taxes a double-edged sword. Sure, raising taxes gets you an instant monetary increase; you can see that just by looking at the Treasury indicator. What isn't readily apparent is the effect higher tax rates have on your colonies. For each 10 percent you increase the tax rate, your workers generate 10 percent less production per colony. That means that, if you increase the tax rate to 50 percent, industrial production *reduces by half* in all your colonies. Unless your colonies are super-productive, this production hit could cripple or seriously hamper construction projects.

Never leave tax rates at consistently high levels just to compensate for a negative income problem. If your income is negative for an extended period of time, or you must keep your taxes above 10 percent to show a profit, you're doing something wrong. Try constructing money-producing buildings like Spaceports on your colonies, or sell off some of the buildings that cost you maintenance but return little or no benefit. You'll find that proper empire management keeps your income positive without necessitating a consistently high tax rate.

Commerce

Trade and commerce are vital to any economically healthy society. Unfortunately, in MOO II, it's pretty easy to overlook the economic advantages commerce provides.

The earliest available forms of commerce are the sale of Trade Goods and surplus food. You can produce Trade Goods from the start, no matter what your technology level. They are, in fact, the default production item of every new colony. A colony can produce one unit of Trade Goods per turn, which is automatically sold for 1 BC. Money from Trade Goods sales accrues to your gross income.

Excess food is also sold for profit. Any food not used to feed your colonists is sold off at the rate of 1 BC per two units of food. These profits also accrue to your gross income.

As the game progresses, other forms of commerce become available. Many of these take the form of colony buildings (see Table 5-21).



Note

The Expert Traders' racial ability increases

the profit you receive from commerce: Every unit of Trade Goods sold nets 1.5 BC, and every unit of excess food sold generates 1 BC. Expert Traders also receive 25 percent more profit from trade treaties with other races.

Table 5-21. Buildings that increase commerce income.

Building	Technology Required	Effect
Galactic Currency Exchange	Galactic Economics	Increases the BC generated in the colony from all sources by 50%
Planetary Stock Exchange	Macro Economics	Doubles the BC generated in a colony from all sources
Space Port	Astro Engineering	Increases the BC generated in the colony from all sources by 50%



Note

The effects of all economic-improvement

buildings are cumulative.

Keeping Up with Maintenance Costs

Colony and empire management's single most money-consuming aspect is maintenance. Most of your expenses in this area involve the inherent maintenance costs of colony buildings. Every building has a base maintenance cost you must pay every turn. Usually, this cost is between 1 and 3 BC per turn; that's not a lot when taken individually, but it can add up quickly.

Unfortunately, the only ways around paying maintenance on a building are:

1. Sell the building.
2. Don't build it in the first place.

The first option is certainly viable, provided the building in question is of little or no benefit to the colony. Don't continue to pay maintenance on a building that does nothing positive for you.

Of course, you can avoid the necessity of option 1 completely if you choose option 2. For example, on a specialized agricultural or industrial colony where you intend to generate no science, there's no need to build a Planetary Supercomputer (whose only effect is to increase research effectiveness by 2 RP per scientist). Wise building habits are the key to keeping building maintenance costs under control.

The other money-sucker that falls under this general category is ship maintenance. Although not technically a colony management issue, the cash outlay for this item does affect your empire's overall financial efficiency.

As we explained in Chapter 4, every ship requires maintenance each turn in an amount equal to the ship's size rating. Ship maintenance is first extracted from your Command Rating. If your Command Rating isn't high enough to cover the needs of your entire fleet, the

difference comes out of your gross income each turn—at 10 BCs per point! That means if you expand your fleet beyond your Command Rating's capacity to maintain it, you create a *major* drain on your finances. If you continue to operate such a fleet, it's a great way to go broke.

The answer to this problem is simple: avoid building a fleet too big for your Command Rating. In the beginning this isn't easy, especially in a Pre-Warp game. Your Command Rating is extremely low in the beginning—so low, in fact, that a single Huge ship exceeds its capacity for maintenance. Take heart! As soon as you start establishing new colonies, you'll be able to increase your Command Rating by leaps and bounds. If you want to have a really big fleet, make sure that every new colony has a Star Base or some other structure that enhances your Command Rating.

Fast Money (Selling Stuff)

You might have noticed that, by clicking on a building on the Colony Screen, you get the option to sell it. This might lead you to believe that selling buildings is a good source of supplementary income in times of financial need.

Wrong. The problem with this tactic is that selling colony buildings nets only a fraction of their value. To determine how many BCs you'll receive for selling a building, take the building's cost in production points and divide it by two. That's right—the Hydroponic Farm that cost you 60 production points to build (or 240 BC to buy outright) nets you a grand total of 30 BC when you sell it.

Because the building sales exchange rate is so lousy, you should *never* use this tactic as a fund-raising method. It's to your advantage to sell colony buildings in only two situations. The first, as mentioned earlier, is if your maintenance costs are too high. Selling off a building or two in this situation not only decreases your per-turn expenses, it adds a few BCs to your treasury.

The second, and more compelling, reason to sell buildings is in the face of an oncoming attack by superior forces. If you know in advance that a superior fleet of ships you have no hope of defeating—an Antaran invasion force, for example—is about to attack one of your colonies, you can cut your losses by selling off *all* the buildings before the attack commences. That way, instead of having all your buildings destroyed and nothing to show for it, you'll at least have a couple hundred BCs in your pocket. That's almost enough to buy a new Hydroponic Farm when you restart the abandoned colony.

SCIENCE

In the fervor of food and production management, it's easy to lose track of the third item your colony's population produces—science. Each population unit assigned to science produces 3 RPs every turn, before taking racial and other modifiers into account. The RPs all your colonies produce are pooled together and added to the subject you're currently attempting to discover.

Chapter 6 details research more extensively—how it works, how you can improve a colony's research capacity, and so on. For now, however, just keep in mind that while the amount of research a colony produces doesn't have a significant impact on that colony individually, a consistently poor science base throughout your empire can lead to a very short game. Balance is the key. Don't ignore science in favor of production and food unless it's absolutely necessary.

ROUTING INVASIONS

Nothing is worse than investing lots of time and effort to get a colony running just right, and then having the Elerians decide they want to add your world to their happy little empire. Lest we forget the real purpose of the game, the object of MOO II is galactic conquest; the care

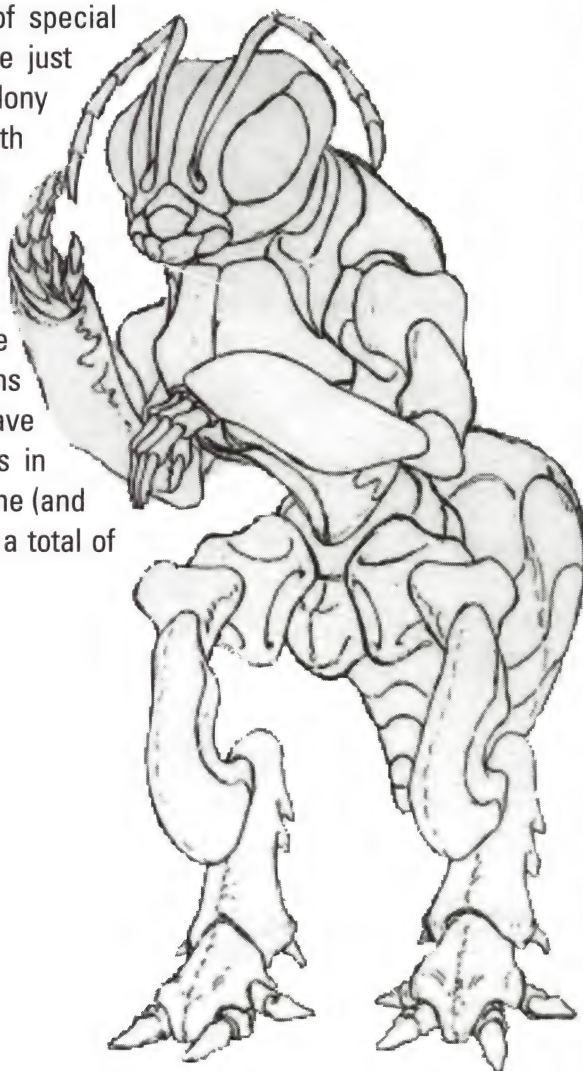
and nurturing of colony worlds is just one piece in the larger picture. In other words, to keep *your* colonies, you must defend them.

Chapter 7 discusses the ins and outs of bombardments and ground combat, and describes all planetary defense and weapons systems.

COLONY LEADERS

Colony leaders are extremely helpful.

They possess a variety of special abilities that can enhance just about any aspect of colony operations. A leader with the right skill combination can mean the difference between an adequate colony and an exceptional one. Appendix B lists all the game's leaders and explains their abilities. You can have up to four colony leaders in your employ at any one time (and four ship officers, too, for a total of eight).





CHAPTER 6

RESEARCH



ACQUIRING NEW TECHNOLOGY is integral to *Master of Orion II*, as it is in many strategy games. The research choices you make often spell the difference between complete success and utter failure. To make the most intelligent choices possible, you must know in advance the advantages and possible consequences of each decision you make.

In this chapter we focus on research. First, we'll look at the way the research system works. Next, we'll examine all available fields of study, research topics, and applications, and give you some insight into how to make the right choice when selecting which application to research; we'll also look at problems you might encounter along the path to enlightenment and reveal possible solutions to these difficulties. Finally, we'll explain some ways to add new technologies to your arsenal of knowledge *other* than research.

THE RESEARCH SYSTEM

In most ways, MOO II's research system resembles those found in other strategy games. In MOO II, your research efforts are measured in Research Points, or RPs. Each turn, the scientists on all of your colonies produce a certain number of Research Points; these are pooled and applied to the current research topic. Once you've accumulated the requisite number of RPs—or a randomly determined few turns later—you discover the technology and have the opportunity to select a new topic.

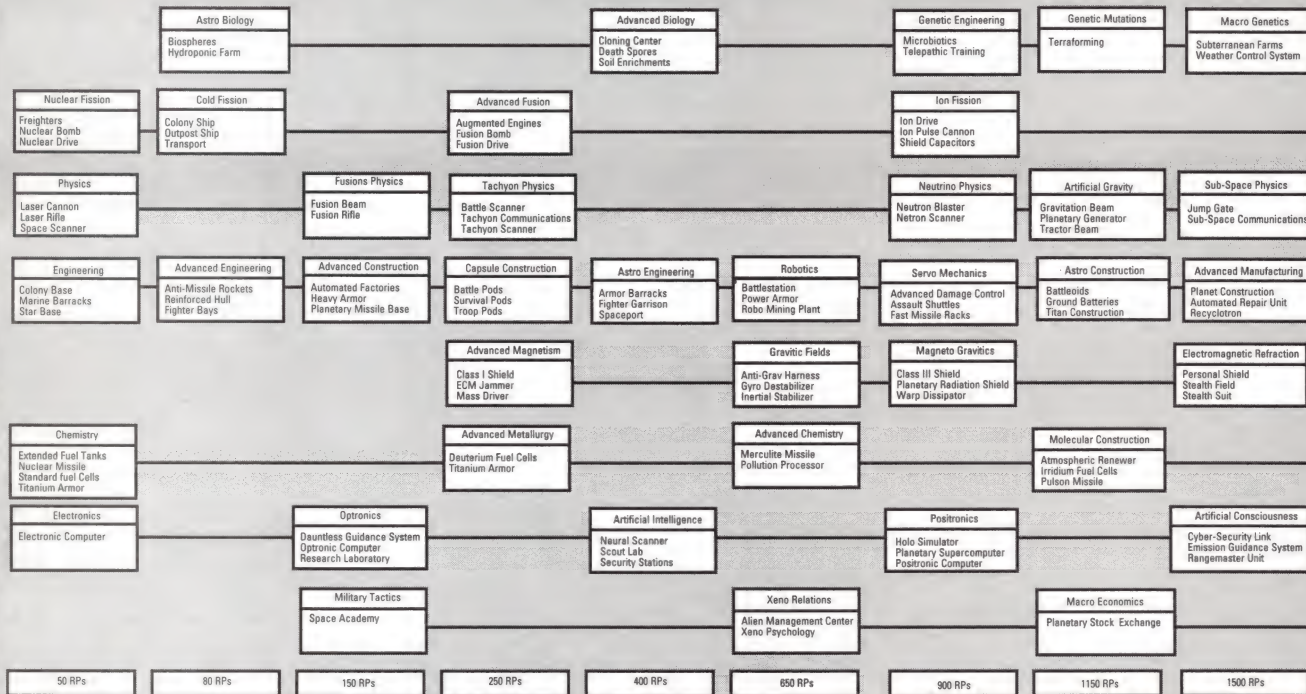
In most strategy games, acquiring new technologies is a pretty straightforward, one-to-one affair: When you complete research of a new technology, you gain the ability to research a more advanced technology and/or you can build some item that takes advantage of the technology you just discovered. In MOO II, things aren't quite so simple. Each field of study is divided into several individual research topics. Each research topic then, in turn, breaks down into a number of practical applications—equipment, buildings, weapons, and so on. So far, so good.

The catch is that, when you choose a research topic to pursue, you also must choose the *practical application* you want to pursue. Once you've chosen the application, research proceeds. When this research is complete, the application you chose becomes available to you. However, you never again get an opportunity to research the applications you *did not* choose. The only way you'll ever acquire those applications is by trading technologies with (or stealing them from) other races, or by capturing or stealing the application from your opponents. (See the section "Other Means of Acquiring Technology" later in this chapter for details.)

Other than this rather significant deviation, the M00 II research system follows a rather simple and straightforward research tree. Figure 6-1 shows the complete research tree, including research costs and all possible applications for each research topic.



FIGURE 6-1. THE RESEARCH TREE.



AVAILABILITY OF APPLICATIONS

Under some circumstances all possible applications may not be available for each research topic. For the vast majority of races, every application is always available. However, if your race has the Uncreative disadvantage (see Chapter 3), *only one application per research topic is ever available for study*. The game selects this application randomly. You must obtain other applications in that field by

Evolutionary Genetics		Artificial Life		Trans Genetics		Hyper Advanced Biology	
Heightened Intelligence Psionics		Bio-Terminator Universal Antidote		Biomorphic Fungi Evolutionary Mutation Gala Transformation			
Anti-Matter Fission	Matter-Energy Conversion	High Energy Distribution	Hyper Dimensional Fission	Interphased Fission		Hyper Advanced Power	
Anti-Matter Bomb Anti-Matter Drive Anti-Matter Torpedos	Food Replicators Transporters	Energy Absorber High Energy Focus Megaflexes	Hyper Drive Hyper-X-Capacitors Proton Torpedos	Interphased Drive Neutronium Bomb Plasma Torpedos			
Multi-Phased Physics	Plasma Physics		Multi-Dimensional Physics	Hyper-Dimensional Physics	Temporal Physics		Hyper Advanced Physics
Multi-Phased Shields Phasor Phasor Rifle	Plasma Cannon Plasma Rifle Plasma Web		Dimensional Portal Disrupter Cannon	Hyperspace Communications Mauler Device Sensors	Star Gate Stellar Converter Time Warp Facilitator		
Advanced Robotics	Tectonic Engineering		Superscalar Construction		Planetoid Construction	Hyper Advanced Construction	
Bomber Rays Robotic Factory	Core Waste Dumps Deep Core Mining		Advanced City Planning Heavy Fighters Star Fortress		Artemis System Net Doom Star Construction		
Warp Fields	Subspace Fields	Distortion Fields	Quantum Fields	Transwarp Fields		Temporal Fields	Hyper Advanced Fields
Lightning Field Pulsar Warp Interdictor	Class V Shield Gauss Cannon Multi-Wave ECM Jammer	Cloaking Device Hard Shields Stasis Field	Class VII Shield Planetary Flux Shield Wide Area Jammer	Displacement Device Inertial Nullifier Subspace Teleporter		Class X Shield Phasing Cloak Planetary Barrier	
Nano Technology			Molecular Manipulation	Molecular Control		Hyper Advanced Chemistry	
Microлите Construction Nano Disassemblers Zortium Armor			Neutronium Armor Urridium Fuel Cells Zeon Missile	Adamantium Armor Thorium Fuel Cells			
Cybertronics		Cybertechnics	Galactic Networking	Moleculartronics		Hyper Advanced Computers	
Autolab Cybernetic Computer Structural Analyzer		Android Farmers Android Scientists Android Workers	Galactic Cybernet Virtual Reality Network	Achilles Targeting Unit Molecular Computer Pleasure Dome			
Teaching Methods			Advanced Governments	Galactic Economics		Hyper Advanced Sociology	
Astro University			Confederation Federation Galactic Unification Imperium	Galactic Currency Exchange			
2000 RPs	2750 RPs	3500 RPs	4500 RPs	6000 RPs	7500 RPs	10,000 RPs	15,000 RPs
							25,000 RPs + 10,000 RPs Per Level

means other than research. (See the section "Other Means of Acquiring Technology" later in this chapter for details.)

One set of applications can *never* be discovered during the normal course of research. These applications are known only to the Antaranans and, as a result, only become available to you when you capture an Antaran vessel. Table 6-1 lists all the Antaran applications.

Table 6-1. (Antaran Applications.)

Black Hole Generator

Damper Field

Death Ray

Particle Beam

Phase Shifter

Quantum Detonator

Reflection Field

FIELDS, TOPICS, AND APPLICATIONS

Some of your most difficult decisions in MOO II involve the application you choose each time you research a topic. To make an informed decision when the time comes, you must have a good working knowledge of each available application. The game manual explains each application, so we won't waste space here redescribing them. Instead, we'll concentrate on helping you make a good choice. In this section we list every field of study, the research topics in each field, and the possible applications for each topic. The application type is listed alongside the name of each application.

GENETICS

The field of Genetics involves the study and manipulation of all forms of life. The research topics in this field lead to developments in everything from enhanced farming techniques to biological weapons.

Astro Biology **(Research Cost: 80 RPs)**

Applications

Biospheres (*Building*)

Hydroponic Farm (*Building*)

Although the temptation is great to jump right into research topics with weapons and space-flight potential, Astro-Biology should, in most cases, be the first topic you study in a Pre-Warp game. It's usually quite awhile before your neighbors come calling, so there's plenty of time for weapons and engines later; besides, most of the applications available through the other early fields of study provide no immediate benefits. The applications you get from Astro Biology are useful as soon as you get them.

Unlike the other early fields of study, Astro-Biology forces you to choose between its applications. Both are useful, but the more valuable of the two is the Hydroponic Farm. Once you build one of these on your home world, you can free up some of your farmers production or science duties (both of which are particularly helpful early in the game). Also, the Hydroponic Farm is invaluable once you start colonizing worlds where food potential is low or nonexistent. Biospheres, although they have their place, aren't nearly as universally useful.



Tip

There is a way to avoid all the decision-making involved when it comes to picking applications. If you play a race that has the Creative special ability, you receive *every application* in every field you research. If you find you still have a problem choosing between applications even after you read this chapter, do yourself a favor and play a Creative race. Problem solved.

Advanced Biology **(Research Cost: 400 RPs)**

Applications

Cloning Center (*Building*)

Death Spores (*System*)

Soil Enrichment (*Building*)

The research topics in Genetics jump up pretty quickly in price. That, plus the fact that applications from other fields of study usually take precedence, means it will probably be a while before you get around to Advanced Biology.

Choosing between these three applications comes down to your style of play and immediate needs. The “style” part comes in where Death Spores are concerned. This weapon brings with it a severe diplomatic risk: Races that use biological weapons experience negative repercussions when Council votes circles. That, combined with the slim chance of Death Spores actually killing a unit of population, makes this weapon too costly to use.

That brings us to “need.” If food is a problem in your colonies, Soil Enrichment is your best choice, as it bolsters food production. If, on the other hand, you have plenty of food and you just want bigger colonies, go for the Cloning Center. Of the three available applications, the Cloning Center provides the most immediate benefit. The only problem is that the Cloning Center loses its usefulness once the colony grows to its maximum size; then it’s just a building that sucks up maintenance costs. Soil Enrichment is a gift that keeps on giving, and thus the best choice of the three.

Genetic Engineering **(Research Cost: 900 RPs)**

Applications

Microbotics (*Achievement*)

Telepathic Training (*Achievement*)

There are only two applications available under this topic, and the choice between the two is pretty clear-cut. The effects of Telepathic Training are very narrowly focused, and unless your game relies heavily on your spying ability, you needn't even consider this application.

Microbotics, on the other hand, has a number of very useful effects. Not only does it help reduce planetary pollution, it also acts to deter your opponents' use of Death Spores and Bio-Terminators by decreasing the probability of success for biological weapons. It doesn't take an expert to see that this application is the more versatile and useful of the two.

Genetic Mutations **(Research Cost: 1,150 RPs)**

Applications

Terraforming (*Environmental Alteration*)

Not much choice here. Terraforming is the one and only application available under the Genetic Mutations topic. But what an application! Until Gaia Transformation becomes available, Terraforming is the single most powerful thing you can do to manipulate a colony's environmental conditions. Obviously, you must study this research topic eventually; but if you're having trouble finding decent colony worlds, quickly acquiring Terraforming technology can be just what you need to get your empire going.

Macro Genetics **(Research Cost: 1,500 RPs)**

Applications

Subterranean Farms (*Building*)

Weather Control System (*Building*)

Macro Genetics means food production, no matter how you slice it. It's up to you to choose which of the two applications applies best to your situation when you research this topic.

Subterranean Farms are most useful when you have a lot of planets that are incapable of producing food. Regardless of what these planets can produce on the surface, a Subterranean Farm adds 4 food to the total planetary production. Good deal.

On the other hand, if most of your planets have farming capacity—*any* farming capacity—go for the Weather Control System. This building increases food output by two units per farmer. That means that building a Weather Control System on a colony with three or more farmers generates more extra food than if the same planet had a Subterranean Farm. Pick the application that best suits the majority of your colony worlds.

Evolutionary Genetics **(Research Cost: 2,750 RPs)**

Applications

Heightened Intelligence (*Achievement*)

Psionics (*Spying*)

Evolutionary Genetics is all about improving the mental state of your empire, and choosing between its two applications is a matter of playing style and the prevailing situation.

Heightened Intelligence gives you a considerable research bonus: +2 for *every* scientist in your empire. Because of the steep research costs in the last third of the research tree, every research bonus you can grab is helpful; and this one is pretty darned big!

The benefits of Psionics are much more subtle. Like Telepathic Training, Psionics provides you with a Spying bonus; but in addition, Psionics improves morale on all your planets by 10 percent (if your ruling system is a Dictatorship or an Imperium). Although more useful than Telepathic Training, the benefits of Psionics still don't compare to the benefits of Heightened Intelligence. Consider Psionics only if you're confident in your current research ability and/or you rely heavily on spying to achieve your goals.

Artificial Life **(Research Cost: 4,500 RPs)**

Applications

Bio-Terminator (*System*)

Universal Antidote (*Achievement*)

Choosing an application in this research topic is literally a choice between life and death.

Life is the Universal Antidote. This achievement takes over where Microbotics left off, providing significant protection against both Death Spores and Bio-Terminators. In addition, it increases the growth rate of all your colonies by a whopping 50 percent!

Death is the Bio-Terminator. This biological weapon is twice as effective as Death Spores, and it brings down just as much diplomatic grief. Unless you're a warmonger with a healthy rate of population growth and no fear of diplomatic reprisals, choosing "life" over "death" will serve you better.

Trans Genetics **(Research Cost: 7,500 RPs)**

Applications

Biomorphic Fungi (*Achievement*)

Evolutionary Mutation (*Achievement*)

Gaia Transformation (*Environmental Alteration*)

Trans Genetics presents the most difficult choice in the entire Genetics field. Not one, not two, but *all three* are equally useful and indispensable. Unfortunately, you *do* have to make a choice. So, here goes.

Consider your situation. In all likelihood, you won't get to this research topic until late in the game. If you've managed your colonies at all successfully, food shouldn't be a problem. That being the case, you can forgo Biomorphic Fungi. Although it's neat to be able to grow food on lifeless worlds, if you're growing enough food on other planets to support your agriculturally underprivileged colonies, you don't really need any more.

Gaia Transformation is not quite so easy to dismiss. If you've ever had the luxury of colonizing a Gaia world, you know just how lucrative such a colony can be. Combined with Terraforming, this achievement allows you to turn just about any planet into a lush, Gaia world in a few easy (albeit expensive) steps. Tempting; but think about it: If your empire runs efficiently as it is, do you really need to change all your planets to Gaia worlds? Probably not.

So that leaves Evolutionary Mutation. Of the three applications here, this one is the best one to get in the latter portion of the game. You can use the four additional picks you get as a result of this achievement to bolster your combat abilities, your research abilities, or pretty much *any* aspect of your race you deem to be lacking. This additional push during the final battles of the game could be a deciding factor. Also, consider what it might do to your chances of being elected winner by the Council if your race suddenly becomes Charismatic and makes nice with everybody a dozen turns or so before the vote. ...

POWER

Although its name seems to indicate that this field deals exclusively with energy sources, Power is actually a multifaceted field of study encompassing a wide variety of topics. Within this field are topics that lead to new drive systems, starship designs, and a variety of weapons systems.

Nuclear Fission **(Research Cost: 50 RPs)**

Applications

Freighters *Ship*
Nuclear Bomb *(System)*
Nuclear Drive *(System)*

Nuclear Fission is the most basic Power research topic. The applications found here and form the cornerstone of your early spacefaring efforts. When you complete research on this topic, you automatically receive *all three* applications.

Cold Fusion **(Research Cost: 80 RPs)**

Applications

Colony Ship *(Ship)*
Outpost Ship *(Ship)*
Transport *(Ship)*

The next step up the Power ladder also provides some of the basic applications you'll need to begin expanding your empire. Like Nuclear Fission, you automatically gain all the applications associated with Cold Fusion as soon as you complete your research on this topic.

Advanced Fusion (Research Cost: 250 RPs)

Applications

Augmented Engines (*System*)

Fusion Bomb (*System*)

Fusion Drive (*System*)



Note

Just because you gain knowledge of

an application doesn't mean you'll instantly be able to use it. For example, if the first two things you research in a Pre-Warp game are Nuclear Fission and Cold Fusion, you gain knowledge of all the applications associated with the two fields of study. However, you can't produce any of the ship-related applications until you've researched Chemistry and gained knowledge of Titanium Armor (the most basic material available for ship hulls) and Standard Fuel Cells.

Advanced Fusion is the first topic in the Power field that requires you to choose between applications. Because it's usually pretty early in the game when you reach this topic, it's likely you've yet to engage in combat. In fact, if you're playing in a Large or Huge galaxy, you probably *won't* engage in combat for quite some time. That means the additional combat speed Augmented Engines provides and the enhanced orbital attack capabilities of the Fusion Bomb are of limited immediate use.

On the other hand, your exploration and expansion efforts are just ramping up to a fever pitch at this point. That makes Fusion Drive the favorite here. Increasing your ships' speed by 50 percent saves you travel time and allows you to expand your empire more quickly.

Ion Fission (Research Cost: 900 RPs)

Applications

Ion Drive (*System*)

Ion Pulse Cannon (*System*)

Shield Capacitors (*System*)

Here, you have three choices—but you can easily narrow it down to two. As we pointed out in Chapter 4, the Ion Pulse Cannon is a very powerful weapon. Unfortunately, it's also a very *expensive* one. You can easily skip it without ever missing it.

Which brings us to the other two choices. Do you find yourself at war frequently? If the answer is "yes," Shield Capacitors are probably for you. Their ability to recharge your shields at an increased rate greatly extends your vessels' survivability in battle.

Are you still sitting in the corner of a Huge galaxy and have yet to make contact with any of your neighbors? Well, then, exploration's probably still your focus at this point. Ion Drive increases your interstellar travel speed by at least one-third (more, if you never researched Fusion Drive).

The verdict? It depends on your needs; but before you turn down Shield Capacitors, think about the neighbors you're bound to run into eventually.

Anti-Matter Fission **(Research Cost: 2,000 RPs)**

Applications

Anti-Matter Bomb (*System*)

Anti-Matter Drive (*System*)

Anti-Matter Torpedoes (*System*)

Anti-Matter Bombs and Torpedoes are definitely good additions to your arsenal, and Anti-Matter Drive, like every successive drive system, adds one parsec per turn of speed over its predecessor. Your situation should dictate your choice here. If you haven't upgraded your drive systems for a while, go for the Anti-Matter Drive. Big, well-armed ships are useless if you can't get them to their destinations ahead of your opponents. If you're satisfied with your current drive system, the choice is obviously between the two weapons. Our advice is to go for the Torpedoes; the Bombs can wait unless you have a pressing need to whack a colony.

Matter Energy Conversion (Research Cost: 2,750 RPs)

Applications

Food Replicators (*Building*)

Transporters (*System*)

This is another research topic where you must choose between helping out your colonies or moving forward militarily.

Food Replicators turn production into food. That makes them extremely valuable on worlds with little or no food growing capacity. On the other hand, it also makes them pricey in terms of the production lost by the colony. On top of that, they're also expensive to maintain—10 BCs per turn adds up quick. Other means of food production, such as Subterranean Farms and Biomorphic Fungi, also generate food on farmless worlds, and at a much lower cost.

If you can do without Food Replicators' expensive food, run, don't walk, to the Transporters. Once you start capturing your opponent's ships right and left, you'll forget all about that replicated food.

High Energy Distribution (Research Cost: 3,500 RPs)

Applications

Energy Absorber (*System*)

High Energy Focus (*System*)

Megafluxers (*Achievement*)

Now here's a dilemma! Do you want to decrease the damage to your ships, increase the damage to your opponents' ships, or significantly increase your ships' space? It all depends on your style. If your policy is

to prevail in battle by using the enemy's own energy against him, you might want to go for the defensive choice—the Energy Absorber. If your goal is more militaristic, and you want to make quick work of any battle you're in, go for the High Energy Focus. The coolest choice here has to be the Megafluxers. This device, which is automatically added to all your ships after it's discovered, increases the space inside your ship by 25%. That means more weapons, more special systems, you name it!

No matter what you choose, you'll definitely want to acquire the two applications you turn down by other means. All three are extremely useful.

Hyper Dimensional Fission **(Research Cost: 4,500 RP)**

Applications

Hyper Drive (*System*)

Hyper-X Capacitors (*System*)

Proton Torpedoes (*System*)

Hyper Dimensional Fission offers the next-to-last engine upgrade, the Hyper Drive. Again, this drive system increases your ships' speed by one parsec per turn. If your drive system is relatively current, you might want to stick with it until you can acquire an improved version by other means.

You can likewise ignore the Hyper-X Capacitor. Remember that although it doubles your beam weapon power on one turn, it forces you to skip a turn to recharge. In other words, it's fire twice, wait; fire twice, wait. ... Not that great an advantage, really.

The best choice here is definitely the Proton Torpedo. This is one of the most powerful torpedo weapons in the game. Better still, it acts like a direct-fire weapon, striking its target on the turn fired. A powerful and useful addition to any arsenal.

Interphased Fission **(Research Cost: 10,000 RPs)**

Applications

Interphased Drive (*System*)

Neutronium Bomb (*System*)

Plasma Torpedoes (*System*)

The last research topic in the Power field brings you a choice between the three types of devices Power best represents—engines, bombs, and torpedoes.

Plasma Torpedoes are powerful weapons, no doubt about it. They're extremely fast and have lots of nasty options available to make them more versatile. Unfortunately, their power dwindles with every square they travel, making short-range attacks a necessity. Although cool to use, they aren't as practical as Proton Torpedoes in the long run.

The Neutronium Bomb's colony-destruction power is unparalleled by any other bomb, but its awesome power makes it a dangerous tool if your goal is to *capture* (rather than destroy) enemy colonies.

The benefit of the third choice, Interphased Drive, is self-evident. Like all other drive systems, it improves on its predecessor's performance by one parsec per turn.

What to choose? It's a toss-up between the Torpedoes and the Drive. Because it's probably late in the game by the time you get to this topic, go for the Torpedoes and have some fun—but steal Interphased Drive from one of your neighbors!

PHYSICS

Like Power, the field of Physics leads to a wide variety of topics and applications. Most of the early Physics applications deal with weapons; and indeed, some of the best weapons available in the game lie down this research path. Many of the strongest suits of the Physics field, however, lie in the areas of communications and fast travel.

Physics **(Research Cost: 50 RPs)**

Applications

Laser Cannon (*System*)

Laser Rifle (*Equipment*)

Space Scanner (*Achievement*)

Physics, the most basic topic in this line of research, provides the same bonus as topics such as Nuclear Fission and Chemistry: You get all available applications for this topic once you finish researching it. In a Pre-Warp game, you can usually start on your basic Physics research last, because you start with no ships and it's unlikely you'll have to defend your home world anytime soon.

Fusion Physics **(Research Cost: 150 RPs)**

Applications

Fusion Beam (*System*)

Fusion Rifle (*System*)

Ship combat or ground combat? That is the question. Actually, the choice is pretty easy. In almost every game, you'll find you need ship-mounted weapons long before you need enhanced weapons for your ground troops. In fact, strong ship-mounted weapons can keep you from ever having to *use* the weapons your troops carry. A well-armed fleet and/or Star Base can prevent the enemy from sending invasion troops to the surface of your planet. Go for the Fusion Beam and forget about the Fusion Rifle.

Tachyon Physics **(Research Cost: 250 RPs)**

Applications

Battle Scanner (*System*)

Tachyon Communications (*Achievement*)

Tachyon Scanner (*Achievement*)

Tachyon Physics is one of those “tough choice” topics. One of the applications, the Tachyon Scanner, is easy to dismiss if your race is Omniscient: Scanning range is of no object if you can already see everything, and this system’s missile bonus is negligible. Otherwise, there are no easy choices here. The slight edge probably goes to the Battle Scanner, which increases your beam weapon hit probabilities by 20 percent *and* increases your ships’ scanning range. Although the added command rating provided by Tachyon Communications is a valuable bonus, you probably won’t need it this early in the game.

Neutrino Physics **(Research Cost: 900 RPs)**

Applications

Neutron Blaster (*System*)

Neutron Scanner (*System*)

Do you like to capture ships? Then the Neutron Blaster is for you. The damage it inflicts to the target ship isn’t too shabby, but the Neutron Blaster *really* shines as a marine-killer. A few solid hits from this weapon, and you reduce the opposition your boarding parties meet significantly.

If capturing ships isn't your thing, choose the Neutron Scanner as your Neutrino Physics application. It greatly increases your bases' scanning range, and it provides a significant ECCM bonus for missiles when installed on your ships; an ability even Omniscient races can benefit from.

Artificial Gravity **(Research Cost: 1,150 RPs)**

Applications

Graviton Beam (*System*)

Planetary Gravity Generator (*Building*)

Tractor Beam (*System*)

You have, essentially, two choices here. The first is between combat and colony management. If you have lots of colonies on Low- or High-G planets and your racial tolerances are low when it comes to gravity problems, you might want to consider the Planetary Gravity Generator. We find, however, that when playing normal races we don't even notice the gravity penalties unless the colony is grossly mismanaged. Therefore, unless your race is gravity disadvantaged (native to a Low-G home world, for example) you can leave this one alone.

That leaves Graviton and Tractor Beams. This choice comes down to preferred combat style. Let's face it: Tractor Beams are fun. There's nothing more humiliating to an opponent than to have his ship held in place by one of your vessels while the rest of your fleet pummels it into submission. The Graviton Beam, however, is just plain practical. An excellent ship destroyer, this weapon becomes particularly deadly when it is given shield-piercing ability. If you're having trouble deciding between these two, take the Graviton Beam. You can always steal Tractor Beams later.

Sub-Space Physics **(Research Cost: 1,500 RPs)**

Applications

Jump Gate (*Achievement*)

Sub-Space Communications (*Achievement*)

The ability to travel at greatly increased speeds between your colonies is a benefit not to be taken lightly. It allows you to move your defensive fleets quickly to the colonies that most need them. Jump Gates are a valuable resource.

The problem with the choice here is that, by this point in the game, you are probably operating a pretty large fleet. That means you need to start increasing your Command Rating. Sub-Space Communications does that—and more. In addition, this application allows you to give orders to your ships while they travel through hyperspace—as long as they're within six parsecs of one of your bases. Unless you have no need to maintain a large fleet, the advantages of Sub-Space Communications outweigh the advantages of Jump Gates.

Multi-Phased Physics **(Research Cost: 2,000 RPs)**

Applications

Multi-Phased Shields (*System*)

Phasors (*System*)

Phasor Rifle (*Equipment*)

This is an instance where defense definitely outweighs offense. As with Fusion Physics, you can pretty much ignore the ground-troop weapon. The best way to defend your colonies from invasion is never

to let the invasion take place! Although Phasors are definitely worth considering, they don't really do that much more damage than their predecessor (Fusion Beams)—unless you add some modifications.

Multi-Phased Shields is definitely the way to go here. Once you equip all your ships with these babies, you'll wonder how you ever survived combat without them.

Plasma Physics **(Research Cost: 3,500 RPs)**

Applications

Plasma Cannon (*System*)

Plasma Rifle (*Equipment*)

Plasma Web (*System*)

In this topic, the decision again comes down to two choices. (Remember what we keep telling you about ground combat weapons?) Both the Plasma Cannon and the Plasma Web are extremely powerful weapons. Unfortunately, both suffer from range limitations. All things considered, the Plasma Web is definitely the more powerful of the two—especially when you layer webs one on top of the other on a single target. The only factor that might sway you to the Plasma Cannon is the Web's slow rate of fire. Just remember that, regardless of which you choose, the ship you mount either of these weapons on requires other weapons for backup—something with long range and a quick firing rate.

Multi-Dimensional Physics **(Research Cost: 4,500 RPs)**

Applications

Dimensional Portal (*Satellite*)

Disrupter Cannon (*System*)

This is an easy choice. Dimensional Portals serve a very specific purpose: They provide access to the Antaran home world. This is something you don't need until you're good and ready to launch an invasion fleet against the Antaran home world, and you don't want to do *that* until you're certain you can win. This one can usually (about 99 per cent of the time) wait until you can steal it or trade for it.

The Disrupter Cannon, on the other hand, provides an immediate benefit. Its power and lack of range penalties combine to make this a truly awesome weapon. The Disrupter Cannon is definitely the better choice here.

Hyper-Dimensional Physics **(Research Cost: 6,000 RPs)**

Applications

Hyperspace Communications (*Achievement*)

Mauler Device (*System*)

Sensors (*Achievement*)

When you research Hyper-Dimensional Physics, one of the hardest decisions in the entire Physics field faces you. Everything here is good. You can dismiss nothing easily.

This topic usually comes late in the game, when most players' fleets are extremely large. Large fleets necessitate high Command Ratings. That makes Hyperspace Communications extremely valuable.

The power of the Mauler Device is above reproach—50 points of damage and an automatic hit every time. However, you must weigh this power against the weapon's severe range limitations. This one is almost useless unless you're at point-blank range, where it's one of the game's most powerful weapons.

Finally, there's Sensors. This achievement provides a sizable boost in your bases' detection range, as well as a *significant* increase in ECCM for missiles controlled by a Sensor-equipped ship.

What to choose? Well, if you like big fleets, Hyperspace Communications is for you. Otherwise, go for Sensors. Even if your race is Omniscient, you'll still have fun with that missile bonus. As for the Mauler Device—there are more effective weapons systems available.

Temporal Physics **(Research Cost: 15,000 RPs)**

Applications

Star Gate (*Satellite*)

Stellar Converter (*Building/System*)

Time Warp Facilitator (*System*)

The last of the Physics topics gives you access to some powerful capabilities. In this case, the sheer power of the two offensive applications completely overshadows the non-combat application (the Star Gate), essentially making the research of Temporal Physics a two-application choice. And what a choice!

The ability to take two combat turns to your opponent's one gives you a truly awesome advantage. That's what the Time Warp Facilitator does for the ships it's installed on. It's an excellent addition to any fleet, to be sure. ...

... But who needs two turns when you can devastate the enemy with a single shot? If any weapon can make short work of a battle, the

Stellar Converter can. This super-weapon is not only a ship-mounted system, but a colony defense weapon as well. No range limitation and a super-powerful blast! If all-out destruction is your preference, this is definitely the application for you.

ENGINEERING

Engineering deals primarily with the field of mechanical engineering. Specifically, the applications that become available as a result of researching topics in this field deal with the construction of such varied items as colony buildings, orbital bases, hulls, and ships. No matter what your style of play, Engineering leads to many vital applications.

Engineering **(Research Cost: 50 RPs)**

Applications

Colony Base (*Building*)

Marine Barracks (*Building*)

Star Base (*Satellite*)

Although the tech chart indicates that this research topic has a cost associated with it, you actually possess knowledge of basic Engineering—and all three of its applications—at the start of the game. (Engineering is the *only* topic you receive automatically in a Pre-Warp game.)

Advanced Engineering (Research Cost: 80 RPs)

Applications

Anti-Missile Rockets (*System*)

Fighter Bays (*System*)

Reinforced Hull (*System*)

It's uncommon for a topic this early in the game to present you with such a difficult choice of applications. But here it is.

Anti-Missile Rockets are a valuable addition to your ships, especially if you're up against opponents who use lots of missiles.

Fighter Bays are excellent, if only as a diversionary tactic; a cloud of incoming fighters tends to occupy your opponent's attention while your ships attack with their big guns. Even if the fighters don't make it to attack range, they still serve a purpose. When they *do* make it through in large numbers, the damage they inflict can be truly devastating.

Probably the best way to go in Advanced Engineering, however, is the Reinforced Hull application. Doubling the amount of structural damage your ships can withstand is a defensive bonus you can take advantage of right away. The other two applications, although wonderful, can wait until you can acquire them through other means.

Advanced Construction (Research Cost: 150 RPs)

Applications

Heavy Armor *System*

Automated Factories (*Building*)

Missile Base (*Building*)

The Engineering field is rife with difficult decisions, and choosing between the applications Advanced Construction offers is no exception. Here's one where no advice is the right advice; you must decide based on the state of the game at the time you research this topic. If your colonies are slow at building things, the production increase you get from Automated factories could solve all your problems. If your colonies are being attacked frequently, and you need a little more firepower than your Star Bases and defending ships can provide, choose the Missile Base. Finally, if your ships seem particularly vulnerable in combat, choose Heavy Armor. It greatly increases your ships' survivability.

Capsule Construction **(Research Cost: 250 RPs)**

Applications

Battle Pods (*System*)

Survival Pods (*Achievement*)

Troop Pods (*System*)

Capsule Construction can be easily narrowed down to two choices: Battle Pods and Troop Pods. Survival Pods are of *extremely* limited use, and are a foolish choice. What would you rather do, carry extra weapons and troops, or ensure your starship leaders' safety? Leaders are a dime a dozen in this game, so Survival Pods are strictly low priority.

The decision between Battle and Troop pods is an issue of personal preference. If your goal is to capture lots of enemy ships, Troop Pods are the right choice. More marines means more captured ships. If you want to build truly devastating starships, go with Battle Pods. With these, you can build ships that are, in effect, much more powerful than their hull size would normally allow. Although expensive, the additional space Battle Pods provides can make small ships fight *big*!

Astro Engineering **(Research Cost: 400 RPs)**

Applications

Armor Barracks (*Building*)
Fighter Garrison (*Building*)
Space Port (*Building*)

Although both the Armor Barracks and the Fighter Garrison are quite useful when it comes to defending colonies, our choice here has to be the Space Port. You can turn around financially impoverished empires completely by adding Space Ports to some or all of your colonies. Even if you're not having cash flow problems, a significant increase in income can't hurt!

Robotics **(Research Cost: 650 RPs)**

Applications

Battle Station (*Satellite*)
Powered Armor (*Equipment*)
Robo Mining Plant (*Building*)

This is another case where we advise you to ignore the ground-troop application and choose between the others available. If we seem to be steering you away from enhancements that aid your ground-defense troops, it's only because space battles are much more common than ground assaults.

Neither the Robo Mining Plant nor the Battle Station should be ignored. Robo Mining Plants increase production, and increased production means your colonies can build whatever you assigned them to build faster. Battle Stations replace Star Bases, and offer vastly improved combat and scanning capabilities, as well as an increase in your Command Rating.

If your colonies' production is extremely slow, go for the Robo Mining Plants. Otherwise, the Battle Station is the hands-down favorite in this topic. If you do go with the mining, there's always the Star Fortress (much, much later).

Servo Mechanics **(Research Cost: 900 RPs)**

Applications

Advanced Damage Control (*System*)

Assault Shuttles (*System*)

Fast Missile Racks (*System*)

Math quiz: Ship A fires one missile every turn for four turns. Ship B fires two missiles each on turns 2 and 4. At the end of four turns, how many missiles has each ship fired? Answer: Four. That, in a nutshell, is the Fast Missile Racks application. More missiles in the air at once usually means that more missiles get through to the target, but in practice not *many* more make it through. Over time, you fire the same number of missiles you would have *without* Fast Missile Racks.

Therefore, the choice here comes down to Advanced Damage Control or Assault Shuttles. This is a difficult choice. Assault Shuttles are indispensable if you intend to capture ships—and if you want Antaran technology, you *have* to capture ships! ADC allows you to attack (and defend) repeatedly with fresh ships. There's no better way to lose a battle than to meet a powerful armada head-on with a fleet of battle-scarred, half-dead ships. As an added bonus, all your ships automatically receive ADC as soon as you research it: No refits necessary. The choice is up to you—but plan on stealing or trading for whichever one you don't research. Both applications can be vital to your success.

Multiplayer Tip: Advanced Damage Control is particularly valuable in multiplayer games because of the way combat works. When multiple opponents attack one of your fleets on the same turn, the attackers are placed in a queue where they await their turn to attack one at a time. Without ADC, your fleet's condition deteriorates with each successive attack. *With* ADC, your ships are good as new each time you face a new opponent.

Astro Construction **(Research Cost: 1,150 RPs)**

Applications

Battleoids (*Equipment*)

Ground Batteries (*Building*)

Titan Construction (*Ship*)

Battleoids provide a terrific boost in ground-based defense, adding a great deal of effectiveness to an existing Armor Barracks. However, as always, the best ground defense is never to let the enemy reach the ground.

To that end, the other two applications in this topic are designed to keep the enemy at bay while they're still in orbit. Although the temptation to build gigantic, weapons-laden starships are overwhelming to most players, cool heads should prevail when choosing an application in this category. The best choice here is Ground Batteries. These massive surface guns are equipped with 30 heavy and 30 point defense versions of your best available beam weapon. This firepower, when combined with the guns of an orbital base and a defending fleet, can be just the push you need to wipe out any force of enemy vessels. Do try to get Titan Construction some other way, though.

Advanced Manufacturing **(Research Cost: 1,500 RPs)**

Applications

Automated Repair Unit (*System*)

Planet Construction (*Special*)

Recyclotron (*Building*)

In this topic, the first thing you can rule out is Planet Construction. Although this is certainly a cool ability to have, you'll seldom run into a situation where you've colonized *every* available planet and just *have* to convert an asteroid field or a gas giant into a new, colonizable world. (Not, at least, until you start vaporizing planets with the Stellar Converter.)

The other two applications are of equal value, and you should obtain through other means the one you choose not to research. Again, research the one that provides you with the biggest *immediate* benefit, and leave the other for later.

Advanced Robotics **(Research Cost: 2,000 RPs)**

Applications

Bomber Bays (*System*)

Robotic Factory (*Building*)

Although both of these applications are extremely beneficial, one of them is *so* beneficial that it becomes the clear choice.

Robotic Factories provide a production increase to any colony that's independent of the number of workers assigned there. The size of the production increase depends on the colony's mineral-richness: The more minerals the colony has, the greater the production

increase. The incredible production bonus this application provides far outweighs the benefits of bomber squadrons. Take the Robotic Factory, and bomb enemy colonies from your capital ships.

Tectonic Engineering **(Research Cost: 3,500 RPs)**

Applications

Core Waste Dumps (*Building*)

Deep Core Mining (*Building*)

The applications made possible through Tectonic Engineering provide a study in opposites. Deep Core Mines provide a dramatic production bonus—+3 per worker! Of course, this extra production contributes to planetary pollution. On the opposite end of the spectrum, Core Waste Dumps *eliminate* all pollution on the planets where they are built.

Unless you have some other means of dealing with pollution, we suggest you choose Core Waste Dumps. Otherwise, Deep Core Mines' production bonus is severely decreased by the resulting pollution. Whichever application you choose, you should definitely find a way to obtain the other one. Both are too useful to ignore completely.

Superscalar Construction (Research Cost: 6,000 RPs)

Applications

Advanced City Planning (*Achievement*)

Heavy Fighters (*System*)

Star Fortress (*Satellite*)

The Star Fortress is the clear winner in this bunch. No other orbital facility provides better firepower and scanning abilities. Each Star Fortress also increases your Command Rating, and automatically repairs any friendly ships that spend time in the system.

Heavy Fighters is a close runner-up; it significantly improves the offensive power of the fighters your ships normally carry. Advanced City Planning, which the maximum population of all your colonies by 5, is by far the weakest application in this topic.

Planetoid Construction **(Research Cost: 7,500 RPs)**

Applications

Artemis System Net (*Satellite*)

Doom Star Construction (*Ship*)

The final rung on the Construction ladder offers a choice between the ultimate starship and an interesting system-wide defense system. Base your decision here on whether you're playing an offensive or a defensive game.

The Artemis System Net provides a defensive sphere of mines that softens up invading fleets before you do battle with them. We can't overstress this application's power; a mine scoring maximum damage against a target can critically damage even a Doom Star-class vessel. It's possible to destroy outright all other ship sizes. This is definitely an excellent choice for defensive players.

Doom Stars, on the other hand, are the largest (and potentially coolest) ships you can build. If conquering your opponents as quickly as possible is your goal, little can stand in the way of a well-outfitted Doom Star-class ship. Doom Star Construction often gives you the final offensive push that allows you to finish off that last, pesky opponent.

FIELDS

As the name indicates, this field of study deals primarily with shields and defensive systems. It also leads to most of the stealth and jamming technology. Although this field need not be your first priority in a Pre-Warp game, it becomes increasingly important as your opponents gain space-flight technology. Getting started in Fields is a little more pricey than in the other fields of study—the first available topic costs 250 RPs!—but the defensive capabilities you gain are more than worth the research cost.

Advanced Magnetism **(Research Cost: 250 RPs)**

Applications

Class I Shield (*System*)

ECM Jammer (*System*)

Mass Driver (*System*)

The choice is very easy when it comes to Advanced Magnetism—the Class I Shield. The benefits you gain from shielding technology, even at this primitive level, far outweigh the Mass Driver's mediocre offensive power and the ECM Jammer's dubious effectiveness. If you get the chance early on, grab Mass Driver technology from somebody: This weapon has the advantage of not losing power over long ranges. You can ignore ECM, though. It's so cheap to add ECCM to missile weapons that almost everyone *does*. Thus, ECM is usually useless.



Note

Fields is one of the two fields of study

that doesn't begin with a research topic that automatically gives you all possible applications. (The other is Sociology.)

Gravitic Fields **(Research Cost: 650 RPs)**

Applications

Anti-Grav Harness (*Artificial Gravity*)

Gyro Destabilizer (*System*)

Inertial Stabilizer (*System*)

When you must decide between something fun and something practical, your common sense dictates "practical." However, if the fun choice is a *lot* of fun, it deserves serious consideration.

In this case, all practical considerations point to the Inertial Stabilizer. Not only does it halve your ships' turning costs in combat, it also adds 20 percent to their Beam Defense rating. This gives your ships a definite edge in combat. It's a very practical device.

Then there's the fun choice. Once you use a Gyro Destabilizer, combat without it seems dull. As weapons go, it inflicts only moderate damage; but watching enemy ships spin like tops is a hoot! Besides being fun to watch, this spinning effect has a decent chance of reorienting the target ship so its main weapons no longer face you, forcing the enemy to expend valuable movement points to get back into combat position.

Just for the sheer fun of it, we recommend the Gyro Destabilizer. You can find some other way to obtain the Inertial Stabilizer, or just wait for the Inertial Nullifier. As usual, the ground-combat-enhancing application is last on the "recommended" list.

Magneto Gravitics **(Research Cost: 900 RPs)**

Applications

Class III Shield (*System*)
Planetary Radiation Shield (*Building*)
Warp Dissipater (*System*)

The winner in this topic is definitely the Class III Shield, which (as its name indicates) has *triple* the strength of the Class I Shield. This is (obviously) extremely valuable in combat.

The other two applications are extremely limited in their usefulness. Although the Planetary Radiation Shield has the effect of slightly reducing planetary damage from orbital bombardments, its main purpose is to make Radiated colonies slightly more hospitable. You can virtually eliminate the need for this building by not colonizing Radiated planets.

The Warp Dissipater is an interesting device, but it's unlikely you'll ever need it. In our experience, computer opponents seldom retreat from combat. If your opponents never try to retreat, you'll never get the chance to use this fascinating little weapon.

Electromagnetic Refraction **(Research Cost: 1,500 RPs)**

Applications

Personal Shield (*Equipment*)
Stealth Field (*System*)
Stealth Suit (*Spy*)

In a complete reversal of the norm, indecision in this topic results arises from the mediocre nature of all three applications rather than the fact that one or more are indispensable.

Personal Shields is a ground troop enhancement that won't even be used if no one lands troops on your colonies. Stealth Fields are definitely useful—when you're moving in for an attack, your opponent can't see you coming—that is, unless your opponent's Omniscient, in which case stealth capabilities are for naught.

Your best bet of the three is probably the Stealth Suit. After all, if you're being forced to decide between available applications, that means you must be using other means to obtain the applications you're forced to pass up. Stealth Suits give your Spies a tiny edge in stealing technology.

Warp Fields **(Research Cost: 2,000 RPs)**

Applications

Lightning Field (*System*)

Pulsar (*System*)

Warp Field Interdictor (*Building*)

This category's throw-away is the Warp Field Interdictor. Its uses are so limited that its cost (both construction and maintenance) outweighs its practicality.

The other two Warp Field applications, however, are very useful. The Lightning Field is an automatic missile, torpedo, and fighter defense that has a 50 percent chance of destroying each of these targets when they enter the ship's square. The Pulsar is a much more powerful, broad-spectrum weapon. It's definitely a great missile/torpedo/fighter killer—more effective overall than the Lightning Field, in fact. The Pulsar has the added advantage of working at range and affecting capital ships as well as minor targets.

The choice between Lightning Fields and Pulsars is tough. For average players, the edge has to go to Lightning Fields. However, advanced players willing to learn the complicated combat techniques required to fully utilize its capabilities might want to try the Pulsar. (See Chapter 4 for details on both of these interesting devices.)

Sub-Space Fields **(Research Cost: 2,750 RPs)**

Applications

Class V Shield *(System)*

Gauss Cannon *(System)*

Multi-Wave ECM Jammer *(System)*

Sub-Space Fields offers the second and final direct-fire weapon in the Field field (the first being the Mass Driver). The Gauss Cannon is a relatively low-cost weapon that's reasonably powerful—especially when equipped as a heavy-mount weapon.

The Gauss Cannon would, in fact, be the item of choice here if not for the Class V Shield. It's a considerable increase over the Class III, and a full *five times* the strength of a Class I. Don't pass up this shield upgrade.

Multi-Wave ECM Jammers are far more effective than standard ECM, but they suffer from the same weakness: They can't divert missiles with ECCM capabilities. Therefore, you can afford to pass on them.

Distortion Fields **(Research Cost: 3,500 RPs)**

Applications

Cloaking Device *(System)*

Hard Shields *(System)*

Stasis Field *(System)*

Distortion Field technology gives you a choice between three diverse defensive applications. The Cloaking Device is an amazing defensive tool; as long a ship remains cloaked, beam weapons have only a 20 percent chance to hit. In addition, long-range scans can't detect cloaked ships. The drawbacks are that missiles ignore the cloaking effect, you must decloak to fire, and Omniscient races can see you no matter what.

The application of choice here is Hard Shields. They provide more consistent defensive bonuses—-2 damage to all incoming attacks regardless of shield strength, protection from Transporters (and, thus, the Marines they transport), and the ability to use shields in nebulas.

What of the Stasis Field? This is another of those devices that's interesting in theory, but of very limited use. Holding ships in stasis only prolongs combat, because you still have to deal with them after you destroy everything else. Although this is an interesting way to reduce the number of ships you must fight at any given time, the short range of this device limits its applications and renders its use potentially dangerous.

Quantum Fields **(Research Cost: 4,500 RPs)**

Applications

Class VII Shield (*System*)

Planetary Flux Shield (*Building*)

Wide Area Jammer (*System*)

These choices fall into roughly the same categories as those under Magneto Gravitics—a ship shield upgrade, a planetary shield, and a ship special system. Once again, the application of choice is the ship shield. Class VII Shields are the game's second most powerful, and a fair jump above their Class V counterparts.

Planetary Flux Shields are only slightly more powerful than their predecessor, Planetary Radiation Shields, and are therefore only slightly more useful. You won't miss them. The Wide Area Jammer is very tempting, and well worth pursuing—but only if you're *certain* your opponents aren't using ECCM. Like all other jamming systems, Wide Area Jammers have no effect on ECCM missiles.

Transwarp Fields **(Research Cost: 7,500 RPs)**

Applications

Displacement Device (*System*)

Inertial Nullifier (*System*)

Sub-Space Teleporter (*System*)

Transwarp Fields mess with the fabric of space in combat situations. All three applications take advantage of this ability in different ways. The Displacement Device provides a 30 percent defensive bonus regardless of your opponent's weapons or targeting equipment. Not too shabby.

The Sub-Space Teleporter lets you travel instantaneously across up to 18 squares of space. This is terrific for getting to close range quickly so you can use your nifty short-range weapons.

Despite these devices' formidable abilities, the award for the most useful application in this topic goes to the Inertial Nullifier. Not only does it give your ship a 40 percent defensive bonus against beam weapons, it allows you to rotate your ship in combat without expending movement points. This extra maneuverability allows you to fire all your weapons and then turn a fresh shield toward the enemy with very little effort.

Because the other applications for this topic are so useful, you should make an effort to acquire them at some point.

Temporal Fields **(Research Cost: 15,000 RPs)**

Applications

X Shield (*System*)

Phasing Cloak (*System*)

Planetary Barrier Shield (*Building*)

The last Force Field topic once again offers a shield upgrade, a planetary shield, and a special system; and, once again, the clear choice is the shield upgrade. Damage prevention just doesn't get any better than Class X Shields—unless you have access to Antaran technology, that is.

The race is a little closer this time around, at least as far as the Planetary Barrier Shield is concerned. Its ability to completely block biological attacks and marine landings makes it the first truly useful planetary shielding system. You might want to grab this one from your neighbors if you get the chance.

The Phasing Cloak is another of those nifty-in-theory, costly-in-practice devices. Sure, no one can attack your ship while it's cloaked; but you can't attack either (unless you decloak). Then there's that "the crew goes nuts after 10 turns cloaked" side effect ...

CHEMISTRY

In *Master of Orion II*, the field of Chemistry is actually about evenly divided between chemical research and metallurgical research. This field deals with everything from fueling your ships to creating newer and stronger alloys to sheath them (and your ground troops!). There are also a number of miscellaneous weapon and colony improvement applications. The Chemistry field's primary benefits are ship improvements; in fact, you can't build spaceships until you complete the first topic in this field of study.

Chemistry **(Research Cost: 50 RPs)**

Applications

Extended Fuel Tanks (*System*)
Nuclear Missile (*System*)
Standard Fuel Cells (*Achievement*)
Titanium Armor (*Achievement*)

Basic Chemistry is the topic in this field that gives you “freebie” applications when you finish researching it. Three applications for the price of one. Enjoy! (Now you know how those Creative races feel when *they* research something ...)

Advanced Metallurgy **(Research Cost: 250 RPs)**

Applications

Deuterium Fuel Cells (*Achievement*)
Tritanium Armor (*Achievement*)

A number of Chemistry topics involve a choice between armor upgrades and fuel cell upgrades. This is the first time you’re forced to make that choice.

Because Advanced Metallurgy comes so early in the game, chances are your expansion effort has met with little resistance (at least in *most* cases). If this is true, then ship range (which is to say, improved fuel cells) is a priority. Later in the game, when your empire covers a wide swath of the galaxy and combat is a daily occurrence, the importance of fuel cells versus armor upgrades is reversed.

Advanced Chemistry **(Research Cost: 650 RPs)**

Applications

Mercurite Missile (*System*)

Pollution Processor (*Building*)

In this early choice between colony improvement and military might, colonies should take precedence. If your planet selection and colony management techniques are on target, pollution is likely to make an early appearance. The Pollution Processor, while not perfect, is more than adequate to deal with early-game pollution problems. Only if you're already embroiled in a war—and, even then, only if you intend to use missiles in your ship designs—should you consider Mercurite Missiles over the Pollution Processor.

Molecular Compression **(Research Cost: 1,150 RPs)**

Applications

Atmospheric Renewer (*Building*)

Iridium Fuel Cells (*Achievement*)

Pulson Missile (*System*)

All the applications of Molecular Compression are equally high in value, and you should analyze the current state of your game and the strategy you're using before you choose between them.

If pollution is a big problem (even after you build a Pollution Processor in your colonies), the Atmospheric Renewer is the right choice. If your weapons of choice are missiles, the Pulson Missile (which has triple the damage potential of the basic Nuclear Missile) is a fine choice.

All things being equal—that is, you aren't having a pollution problem and you aren't particularly fond of missiles—go for the Iridium Fuel Cells. They provide a significant increase in ship range, double that of Standard Fuel Cells, and 50 percent more than the Deuterium variety. This is far more beneficial to you than weapons and buildings you don't intend to use.

Nano Technology **(Research Cost: 2,000 RPs)**

Applications

Microlite Construction (*Achievement*)

Nano Disassemblers (*Achievement*)

Zortium Armor (*Achievement*)

If you haven't upgraded your armor by this point, Zortium Armor should be the first application you consider here. Your starship crews will love you for the 100 percent increase in hull integrity. The bonus, of course, is that your ground troops also gain an increase in strength, as do your fighters, missiles, and shuttles.

Of the other two choices, Microlite Construction, with its substantial production bonus, is the closest contender. If you're hurting for production, skip the Zortium Armor and go for this one. The third choice, Nano Disassemblers, comes in last; if you already have one of the preceding pollution-control applications, you should be able to wait awhile before you require something more effective.

Molecular Manipulation **(Research Cost: 4,500 RPs)**

Applications

Neutronium Armor (*Achievement*)

Urridium Fuel Cells (*Achievement*)

Zeon Missile (*System*)

Here's another armor-versus-fuel-cells choice—this time, with some missiles thrown in to confuse things a bit.

This time around, the missile might be your best choice—that is, if you *use* missiles. Zeon Missiles are the fastest and most powerful missiles available. Of course, if you prefer torpedoes and beams, you can leave this one alone.

That leaves armor and fuel cells. Weigh your needs and decide which ability—added range or added hull strength—benefits you most in the prevailing game situation. If it's still a toss-up, upgrade the most outdated system. All things being equal, take the armor upgrade—it helps your ground troops, too!

Molecular Control **(Research Cost: 10,000 RPs)**

Applications

Adamantium Armor (*Achievement*)

Thorium Fuel Cells (*Achievement*)

Molecular Control finishes out the Chemistry field by maintaining that ongoing theme—armor versus fuel cells. As always, weigh your needs and research the upgrade offering you the best immediate advantage. This time around, plan on obtaining the application you decide not to research: Both Adamantium Armor and Thorium Fuel Cells are *far* too useful to be without.

COMPUTERS

All the advanced missiles and beam weapons in the galaxy are worthless unless you can coordinate their functions effectively. That's where Computers come in. Much of this field is devoted to electronic systems that run your ships and target your weapons. The Computer field also leads to applications in robotics and colony management.

Electronics **(Research Cost: 50 RPs)**

Applications

Electronic Computer (*Achievement*)

Like most other fields of research, Computers starts off with a research topic that gives you a "freebie" application. Unfortunately, it isn't a big deal this time, because there's only *one* application, but what the heck! At least it's a useful one.

Optronics **(Research Cost: 150 RPs)**

Applications

Dauntless Guidance System (*Achievement*)

Optronic Computer (*Achievement*)

Research Laboratory (*Building*)

Something that's helpful when you must choose between three applications is to eliminate those that are extremely specific. Specific bonuses *can* be good; but "specific" often translates to "very seldom used." Sometimes more than one choice is extremely specific. This is the case here. The least useful application on this list is the Dauntless Guidance System, which only gets used if your missile's target happens to be destroyed while the missiles are in flight. As this is not a particularly

common occurrence, the Dauntless Guidance System becomes a very specific application indeed.

The other choices, while each applying to only one aspect of the game, are still more universally valuable than the Dauntless Guidance System. Of the two, you might want to go with the Optronic Computer; the next Computer topic is a lot more expensive, and it might be a while before you get there. On the other hand, if you aren't frequently engaging in combat, go for the Research Laboratory and speed up your scientific advancement.

Artificial Intelligence **(Research Cost: 400 RPs)**

Applications

Neural Scanner (*Achievement*)

Scout Lab (*System*)

Security Stations (*System*)

Artificial Intelligence offers you an interesting mix of choices, each affecting a different aspect of the game. Yet again, you're faced with a situation where you must choose based on your prevailing needs and/or your style of play.

The best all-around choice in this group is the Scout Lab, because it offers two distinctly different bonuses. First, ships equipped with this system add points to your research effort each turn. Second, the Scout Lab's information-gathering capability adds to a ship's beam-weapon accuracy during combat with monsters, the Guardian, and the Antarans.

Neural Scanners and Security Stations perform far more focused (but not necessarily less vital) tasks. If your spying abilities need a boost, the Neural Scanner gives you a *very* slight edge in that department; if your ships are being captured frequently, Security Stations can help you with that problem.

Positronics **(Research Cost: 900 RPs)**

Applications

Holo Simulator (*Building*)

Planetary Supercomputer (*Building*)

Positronic Computer (*System*)

The least useful application on this list is the Holo Simulator; unless your colonies are experiencing widespread morale problems, there's little need for this building.

The other two choices equal each other in value. If you didn't upgrade your shipboard computers when you researched Optronics, choose the Positronic Computer. If you *did* choose the computer last time around, take the science bonus the Planetary Supercomputer offers.

Artificial Consciousness **(Research Cost: 1,500 RPs)**

Applications

Cyber-Security Link (*Achievement*)

Emissions Guidance System (*Achievement*)

Rangemaster Targeting Unit (*System*)

The application choice for Artificial Consciousness is, once again, easier if you concentrate on the applications giving you the widest possible range of benefits. Doing so eliminates the Emissions Guidance System which, while clever, applies only to specific situations in missile combat.

Although the Cyber-Security Link is very helpful when you run spy missions, the best choice here is the Rangemaster Targeting Unit. Although it does nothing to correct their damage dissipation effect over range, the Rangemaster does remove all the range penalties

reducing beam weapon targeting accuracy. The first time you use this system in combat, you'll see a vast improvement in accuracy.

Cybertronics **(Research Cost: 2,750 RPs)**

Applications

Autolab (*Building*)

Cybertronic Computer (*Achievement*)

Structural Analyzer (*System*)

This time around, you can probably ignore the ship computer upgrade; the Cybertronic Computer isn't enough of an improvement over its immediate predecessor to warrant discarding the other two applications Cybertronics makes available.

The choice between the Autolab and the Structural Analyzer is a difficult one, because space battles and research costs are usually escalating at an equal pace by the time you get to this topic. In a purely "conquer-the-galaxy" strategy, the edge goes to the Structural Analyzer, which helps you pummel just about any enemy fleet into submission.

Cybertechnics **(Research Cost: 3,500 RPs)**

Applications

Android Farmers (*Android*)

Android Scientists (*Android*)

Android Workers (*Android*)

As you might have guessed, the choice here is based entirely on your prevailing needs, pure and simple. Pick the android worker that will enhance the aspect of your colonies most needing improvement.

Galactic Networking **(Research Cost: 4,500 RPs)**

Applications

Galactic Cybernet (*Building*)

Virtual Reality Network (*Achievement*)

Believe it or not, the best choice here just might be the VR Network. Sure, the research boost you get from the Galactic Cybernet can be very helpful; and if you're experiencing no negative morale, you probably deem the Cybernet the hands-down favorite. In that case, you've forgotten that you're penalized for negative morale, but you're *rewarded* for positive morale. Every "happy face" you get on a colony's morale line means a 10 percent increase in *all* areas—food, production, and science. Of course, the science bonus isn't as big as the one you'd get with the Cybernet, but the overall effect is much better (especially once you start reassigning farmers and workers to science).

Moleculartronics **(Research Cost: 6,000 RPs)**

Applications

Achilles Targeting Unit (*System*)

Moleculartronic Computer (*System*)

Pleasure Dome (*Building*)

If you've made it this far down the research path, it's likely that all your colonies are operating efficiently—that is, there's no morale problem, and production levels are fine. If so, don't worry about the Pleasure Dome for the time being. That narrows your choices to two ship systems, each extremely useful in its own way.

If your strategy involves capturing enemy ships, no system in the

game is more helpful than the Achilles Targeting Unit. This system is designed to make weapons strike your opponent's weapons and shield systems. Enough well-placed hits and you can drop your Marines in with no problem.

If, on the other hand, your goal is simply more efficient destruction, take the Moleculartronic Computer. It doubles your beam weapon accuracy. If you're torn between these two choices, go with the Moleculartronic Computer; its effects are more general in nature.

SOCIOLOGY

The field of Sociology deals primarily with managing your own people and indoctrinating aliens from captured colonies. This includes the study of more advanced forms of government. Sociology also leads to applications that improve your population's fighting skills, education, and economic base.

Aside from a few choice applications, Sociology is a field you can perpetually put off unless you're trying a pacifistic strategy. Although many of its applications are quite useful, their importance pales in comparison to weapons, shields, and other instruments of war. Sociology's upside is that choosing between applications is usually pretty easy; the majority of its research topics lead to only a single application.

Military Tactics **(Research Cost: 150 RPs)**

Applications

Space Academy (*Building*)

The only choice you have when it comes to this topic is *when* to research it. Of all the early topics available, this one seems least important. Indeed, you won't really feel the Space Academy's effects until combat becomes commonplace. Your best bet, however, is to get this topic out of the way as soon as you gain rudimentary space-flight capability. Although you won't really need to build Space Academies for awhile, you *might* need access to some of the other applications down the Sociology path. Therefore, it's best to put this behind you before pursuing Sociology becomes an urgent matter.

Xeno Relations **(Research Cost: 650 RPs)**

Applications

Alien Management Center (*Building*)

Xeno Psychology (*Achievement*)

Xeno Relations presents you with a tough decision that is more easily made if you plan your overall game strategy in advance.

The Alien Management Center is an essential building if your strategy involves taking over your opponents' existing colonies. Without it, you run the risk of captured colonial populations revolting and retaking the colony you worked so hard to capture. Of course, if you prefer bombing enemy colonies into oblivion and starting new ones of your own, the Alien Management Center is something you'll never need.

Which brings us to Xeno Psychology. It never hurts to have a diplomatic edge in negotiations, and this achievement gives you just that. A 30-point Diplomacy bonus can mean the difference between a cease-fire and all-out war (especially after you've been bombing colonies). If you don't intend to capture colonies, Xeno Psychology is the correct choice.

Macro Economics **(Research Cost: 1,150 RPs)**

Applications

Planetary Stock Exchange (*Building*)

Like a number of other topics in the Sociology field, you don't get any choice of applications here. This is one of the applications that makes pursuing Sociology worthwhile. A Planetary Stock Exchange on every colony significantly improves your financial standing.

Teaching Methods **(Research Cost: 2,000 RPs)**

Applications

Astro University (*Building*)

Another no-choice topic, Advanced Teaching Methods allows you to build the Astro University, which increases the productivity of every farmer, worker, and scientist by one on the planet where it's built. No other Sociology application provides this kind of balanced productivity increase. Unfortunately, Advanced Teaching Methods is a research topic that tends to slip between the cracks in favor of the more combat-oriented applications available in other fields of research in the middle and latter portions of the game.

Advanced Governments (Research Cost: 4,500 RPs)

Applications

Confederation (*Government*)

Federation (*Government*)

Galactic Unification (*Government*)

Imperium (*Government*)

Here's a no-choice topic with four choices. (Huh?) What we mean is, of these four choices, only one is right for you—the government that replaces whichever government you currently have—and only that one shows during the game. The advantages of changing to a more advanced system of government vary according to government type, but making the switch is *always* to your advantage. In fact, depending on your situation, it might be worth slogging through all the earlier Sociology topics just so you *can* change governments.

Galactic Economics (Research Cost: 6,000 RPs)

Applications

Galactic Currency Exchange (*Building*)

If you've made it this far in the game, you probably don't have any financial problems, but, as we've pointed out before, a little extra money never hurt anyone. The Galactic Currency Exchange increases income from all sources in a colony by 50 percent. This application is used most frequently to help finance the construction of the final fleet you need to annihilate that last, pesky enemy.

"HYPER ADVANCED" RESEARCH TOPICS



Note

One final word on research

strategy: *Balance*. In most cases, it's better to be a jack-of-all-trades when it comes to your technologies. For example, it's better to have a decent drive system, shield system, weapons array, and computer than to have Class X Shields on ships with Lasers, Nuclear Drive, and an Electronic Computer. Unless you're at peace and can trade for technologies in other fields, specializing in a single field usually means you'll be playing catch-up with your neighbors in every other field. Striking a balance helps to keep the playing field fairly even between you and your computer-controlled opponents.

You'll note that in each research field, the final topic is labeled "Hyper Advanced." Hyper Advanced research topics give you no additional applications in the field. Rather, each level of Hyper Advanced research adds 5 points to your score and provides another level of miniaturization for each applicable application in the field. These end-of-the-line research topics are extremely expensive in terms of research points—25,000 RPs plus 10,000 RPs per additional level. (For example, Hyper Advanced Biology I costs 25,000 RPs, Hyper Advanced Biology II costs 35,000 RPs, and so on. You can research Hyper Advanced topics forever.) Unless your goal is a super-high score, or you *really* need those extra miniaturization levels, researching Hyper Advanced topics is of questionable use. In the game's later stages, you're better served by transferring your scientists to production and farming duties once you've researched all other available topics.

IMPROVING YOUR RESEARCH CAPABILITIES

If you find you're constantly falling behind your opponents in technology, you need to take steps to improve your empire's research capabilities. There are a number of ways to do so:

- **Create more scientists.** This is the obvious solution. By moving some of your farmers and/or workers to science duties, you increase the rate at which you generate RPs. Although effective when used in moderation or for short periods of time, this method has a detrimental effect on a colony's food and/or industrial production.
- **Create specialized research colonies.** If you happen to find a planet that has the Ancient Artifacts special, establish a colony there and dedicate it to scientific research. Ancient Artifact worlds *double* the RPs generated by scientists stationed there.
- **Racial bonuses.** As described in Chapter 3, some Attributes and Special Abilities enhance a race's research abilities. If slow research is a constant problem for you, consider making these bonuses a part of your race's makeup at the start of the game. You can also take advantage of racial bonuses if you research "Evolutionary Mutation" under the Trans-Genetics research topic. This application allows you to add four points of Attributes and Special Abilities to your race during the game.

- **Research treaties.** A research treaty between you and another race establishes lines of communication between your respective science communities. Each research treaty costs a few BCs to establish (spread over a few turns), but the break-even point comes quickly. Then, as long as the treaty is in place, you get all those additional RPs every turn. You can have as many standing research treaties as there are other races.
- **Colony structures and galactic achievements.** A number of colony buildings and overall achievements increase scientific output. Table 6-3 lists these.

Table 6-3. Buildings and achievements that increase scientific output.

Building/Achievement	Technology Required	Effect
Android Scientists	Cybertechnics	Generate 3 more RPs than biological scientists
Astro University	Teaching Methods	+1 RP per scientist in the colony per turn
Autolab	Cybertronics	+15 RPs per turn in the colony where it's built
Galactic Cybernet	Galactic Networking	+3 RPs per scientist in the colony per turn
Heightened Intelligence	Evolutionary Genetics	+1 RP per scientist per turn in all colonies
Planetary Supercomputer	Positronics	+2 RPs per scientist in the colony per turn
Research Laboratory	Optronics	+1 RP per scientist in the colony per turn
Scout Lab	Artificial Intelligence	Ships equipped with this system generate a number of RPs each turn based on ship size



OTHER MEANS OF ACQUIRING TECHNOLOGY

The most difficult thing about deciding your research path isn't really choosing which applications to pursue. It's deciding which applications *not* to pursue. Just knowing you're giving up your one and only chance to research something makes you constantly second-guess yourself. Even if you follow our expert advice, there's always that little voice in the back of your head every time you choose an application that says, "But what if I need that other thing later?"

Well, take heart. Although you can't go back and research an application you passed up, you *can* obtain pretty much any application you want by other means:

- **Tech Exchanges.** You can, at any time, contact the leader of another race and offer an exchange of technology. (By the same token, another leader can offer *you* the same option.) If you have any technologies that interest your opponent, he offers a technology of his own in exchange. If you both agree to the exchange, you both walk away from the bargaining table with a brand-new application. This method is much faster than going through the research track, and doesn't have the diplomatic repercussions of espionage and conquest (see below). (Just take care not to trade powerful and/or dangerous technologies to someone likely to use them against you!)

- **Conquest.** If you can't join 'em, beat 'em. If your opponents refuse to trade technology with you, either because you don't have anything they want or because they're just obstinate, you have the option to resort to more violent methods. You receive one new application for every colony you conquer, provided your opponent possesses technology you haven't yet discovered. You also receive one or more new ship system application every time you capture and scrap an opponent's ship. Although this method can be very costly in terms of fleet expenditures and losses, it's extremely reliable for obtaining "lost" technological applications. If you win, that is.



Note

Multiplayer Tip:
If you're willing
to join forces

with one or more of your online opponents, you can greatly increase your rate of technological advancement. Coordinate with your allies so you research different fields at any given time. As soon as one of you finishes his topic, he shares it with all members of the alliance. This is a great way to gang up on your opponents and make their lives miserable.



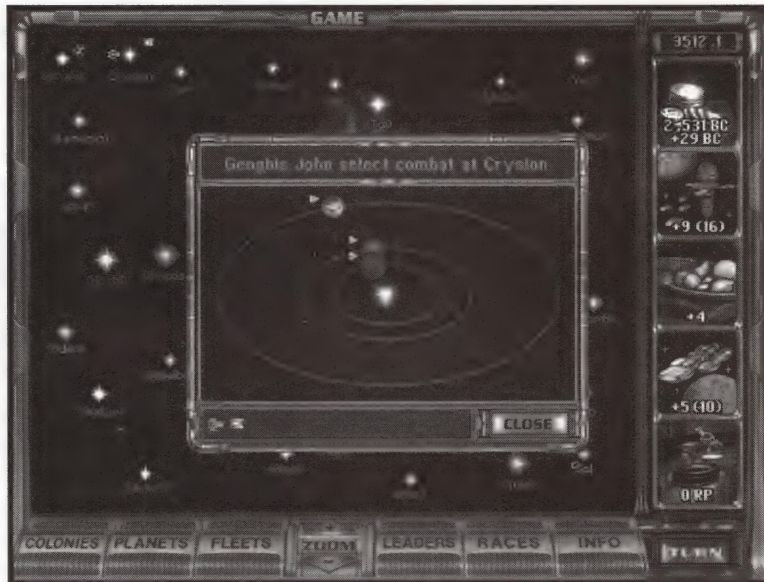
- **Spying.** A network of Spies can serve as a conduit of technology. Every Spy assigned to espionage has a chance of capturing a new technology every turn. The lower right section of the Races screen displays your Spying percentage. Unless you've invested racial picks and/or research to improve your spying capability, this percentage is usually quite low. Thus, spying is usually the least reliable means for obtaining technology. In addition, it has diplomatic repercussions. Each time a Spy successfully steals an application, the victim race assesses a diplomatic penalty against you. Although you can use Spies as supplementary information sources, don't count on them as your sole means for accumulating technology.





CHAPTER 7

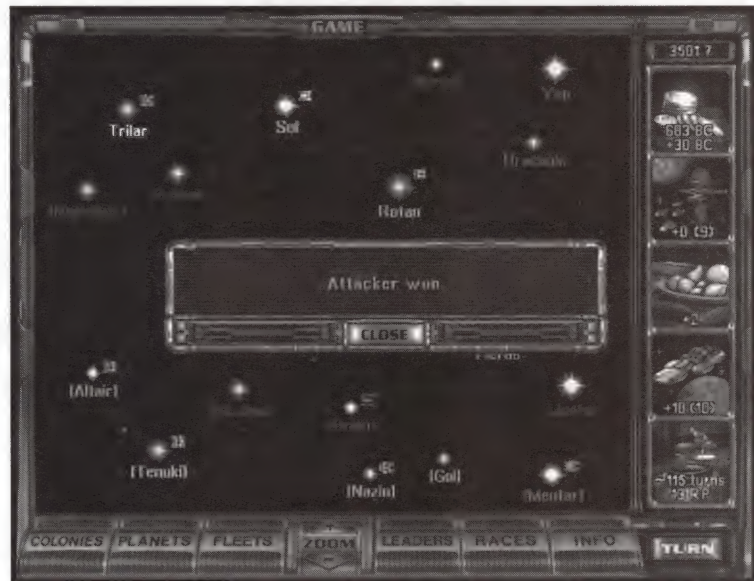
COMBAT



FOR SOME PLAYERS, ship-to-ship combat is the meat of the game. To others, it's an exercise in foregone conclusions better left to the computer. The results of combat determine the game's outcome, but preparation is as important to those results as tactics. In MUD II, a well-equipped fleet of competently-designed ships will triumph over the best combat tactics nearly every time. That doesn't mean there's nothing interesting you can do in ship-to-ship combat; it's just that being prepared for that combat is absolutely vital. You wouldn't go to a gunfight without bullets, would you?

HOW STRATEGIC COMBAT WORKS

Before we get into tactics, let's talk about how Strategic Combat functions. Those of you who prefer to act like generals and leave the details of fighting to the lieutenants probably turn Tactical Combat off. You'll want to know what's behind those terse combat result announcements.



You'll remember from Chapter 4 that each ship size class has a pre-determined number of each weapon type installed. Every ship also has a Defense rating and a number of Hits. (See Table 4-1 in Chapter 4.) Here's what they're for:

- During the first two rounds of combat, all ships and bases with missile weapons do damage. There's no time of flight; every attack is resolved immediately. Every missile weapon fires at a randomly chosen enemy ship or base. The chance of each hitting is:

$$100\% + \text{Systems Bonus} - \text{Jammer Effect}$$

Ship systems available to the attacker that add to the accuracy of missiles provide the Systems Bonus. Jamming technology available to the defender determines the Jammer Effect. If a missile hits, the damage it does is subtracted from the target's Hits. Any destroyed target is removed from the combat immediately and does not attack again.

- Bases continue to fire missiles every round until the end of combat, with the same chance to hit.
- Every round after the first, ships use each special weapon system available to them. Any destroyed target is removed from the combat immediately and does not attack again.
- Ground Batteries fire beginning in round two. Their targeting, chance to hit, and damage work just like ship beam weapons (next bullet).
- After the second round, all the beam weapons on both sides fire every round. Targeting is random, just like missiles and specials. The chance of hitting is:

$$60\% + \text{Computer Bonus} - \text{Target Defense}$$

The best type of computer researched by the attacker's empire determines the Computer Bonus. The Defense of the target appears in Table 4-1. Any destroyed target is removed from the combat immediately and does not attack again.

- Beginning in the fourth round, any ships with Bombing ability do damage to the military installations on the planet below—if there is an enemy colony there. These ships drop all their bombs each turn, and these bombs do damage as usual. (See Table 7-2 for the scoop.)

At any time during this process when a fleet's strength hits zero (or below), the combat is over and the surviving fleet is declared the winner. There are no chances to retreat or surrender and no survivors on the losing side.

GENERAL POINTERS

Like it or not, MOO II ship-to-ship combat is mostly decided by the brute force of applied preparation. The better-equipped, more balanced fleet usually wins, regardless of its tactics. That said, let's get into some of the things you can do to tilt that balance in your favor.



Scan first. There's probably no more important piece of combat advice you can remember than this. Before the shooting starts, use that Scan button on each and every enemy ship, base, and planet in the combat zone. When you know the weapons, firing arcs, ranges, strengths, and weaknesses of each enemy, it's like having extra ammunition. As combat wears on, you might forget some things, so scan again and again. It doesn't cost anything, so why not?

Is Automatic for Me?

The Auto button sits there staring at you, battle after battle, daring you to use it. Most players probably never do, though. What's the point of playing the game, after all, if you're going to hand control over to the AI?

That's a valid point, but there are rare situations in which it might be better to let your ships' crews run things. If you consistently lose battles, even though your fleet is as tough as or stronger than the computer-controlled ones, you might learn something from watching the AI handle things. (If you don't learn anything, you might at least win a combat or two.) To save time in a combat that's already decided, we often let the Auto feature do the mopping up (or fight the futile fight).

Auto can be a useful middle ground between Tactical and Strategic Combat. In general, however, the automated combat option is neither more effective nor more fun than commanding your fleet personally.

Select the weapons you want to use. No, this isn't a rehash of ship design; it's advice not to fire indiscriminately. Remember the little box at the bottom of the combat screen that lists the weapons on your ship? It shows you which are available for use and which are not. It also acts as a switch—you can temporarily de-select any of the weapons. Only the selected weapons fire when you click on a target. Rather than blasting away at a single target with everything, take your time and choose the best target for each weapon. (The info you got by scanning helps you choose.) Combat is a turn-based affair, so it doesn't matter how long you take to make your decisions.

Hurry up and wait. Once you've decide which weapons to use against which targets, fire away. If there are weapons left unused, don't just blast away at a random target. Patience buys opportunities. Hit the Wait button and see what you do with the rest of your ships. Afterward, there might be an obvious target for those leftover weapons.

Follow SPNPAP (pronounced "spin-pap"). What the hell is SPNPAP? It's the order in which a smart commander fires the fleet's weaponry. Use SP—Shield Piercing—first. The enemy's shields are still up and strong, but it doesn't matter to these weapons. Note that most of the damage from this round of attacks is done to the armor. Next, fire the NP—Non-Piercing—weapons. These damage the shields, maybe bringing them down altogether. Any damage that gets through is gravy, and, again, weakens the armor. Last, open up with the AP—Armor Piercing—weaponry. With the shields weakened (or down), the greatest possible amount of AP damage gets through. It goes straight to the internal systems and structure!

Save something for the defense. You have no choice but to save your Point Defense beams, but should that be all? The answer depends on the enemy's missile potential. (Again, scanning comes in handy.) What's about to hit your ship matters, too. Just remember that beams firing automatically in defense have a better chance of hitting than those you fire manually.

Move for a reason. Motion spends movement points, and it narrows your options as it does so. (It also lowers the amount your shields regenerate that round.) Don't move any of your ships unless you have a specific purpose for doing so. Getting a better range for your attacks is one (though it also makes your opponent's range better), and moving out of an enemy's firing arc is another. Just remember to leave enough movement to rotate so the target's within one of *your* firing arcs.

ANTARANS AND OTHER MONSTERS



Note

Reminder:
It's never
worthwhile to

use Assault Shuttles or Teleporters in combat against non-Antaran space monsters. Even though the game treats them as ships, you can't capture monsters. If you do somehow manage to capture the Guardian of Orion, it self-destructs 100 percent of the time.

Some of the toughest opponents your fleets face in MOO II are not from other empires. Space monsters, the Guardian of Orion, and the Antarans can make life impossible for you. We haven't come up with specific strategies that work every time against these creatures, but if you know exactly what you're going up against, you might be able to formulate your own.

Except for the Guardian and Antarans, all space monsters come in two sizes. Regular-size monsters sit in a specific star system and wait to devour your scout ships. Small monsters are the ones that pop up as random events. Both sizes are treated, for combat purposes, as Titan-class ships.

Another interesting thing about space monsters (not Antarans or the Guardian), is that the non-wandering variety always sit on a system with something useful in it. Any system a monster guards has a system special, for one thing. For another, there's always a nice planet involved, as noted in Table 7-1.

Table 7-1. Planets Guarded by Space Monsters

Monster	Size	Environment	Minerals
Amoeba	Medium or bigger	Any	Rich or Ultra-Rich
Crystal	Large or Huge	Terran or Gaia	Rich or Ultra-Rich
Dragon	Medium or bigger	Terran or Gaia	Rich or Ultra-Rich
Eel	Large or Huge	Terran or Gaia	Any
Hydra	Large or Huge	Terran or Gaia	Any

AMOEBAE



Space Amoebae are equipped with these systems:

- Fusion Drive
- Optronic Computer
- Regeneration (Automated Repair Unit)
- Caustic Slime (25–50 Strength Plasma Web)

The regular size has 750 hits and 2 Caustic Slime systems. The small Amoeba comes with only 600 hits and 1 Slime.

You'll note right off that Amoebae have *no* shields, armor, computers, missiles, beams, torpedoes, fighters, or serious special defensive systems. Stay out of range of the Plasma Web, and you can't lose.

CRYSTALS



All Space Crystals are equipped with these systems:

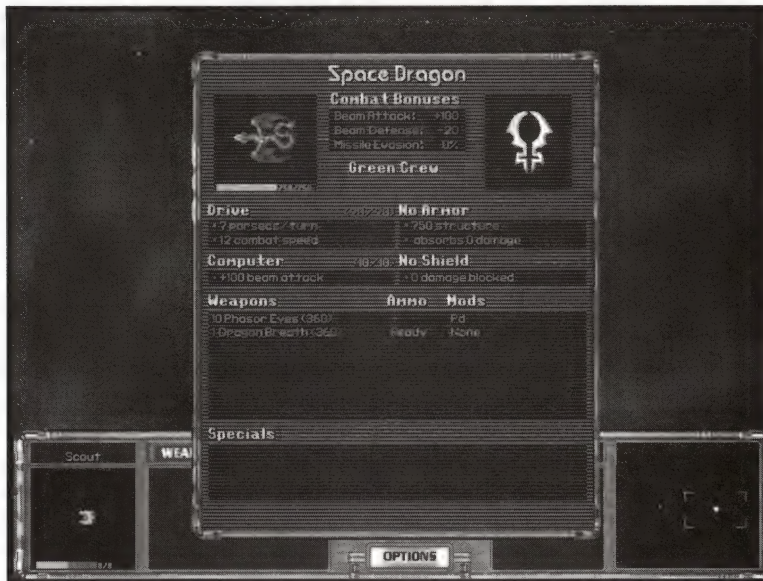
- Moleculartronic Computer
- Rangemaster Targeting Unit
- Crystal Ray (40–80 Hit Death Ray)
- Computer Control

The regular-size version has 2500 hits, an Anti Matter Drive, and a Heavy Mount version of the Crystal Ray that does 60–120 hits. The small Crystals have only 1000 hits.

What's Computer Control? It's a technology that only Space Crystals have (and there's no way for you to get it). Whenever one of your ships runs out of Marines—they're all killed by the evil Crystal Ray—the Crystal takes control of that ship's computer and uses it against you. From then on, that ship attacks your remaining ships. Mixed with the effects of the Crystal's Death Ray, this can be a nasty combination.

Crystals have no defensive systems to speak of, so just blast away as fast as you can, before your ships start to switch sides.

DRAGONS



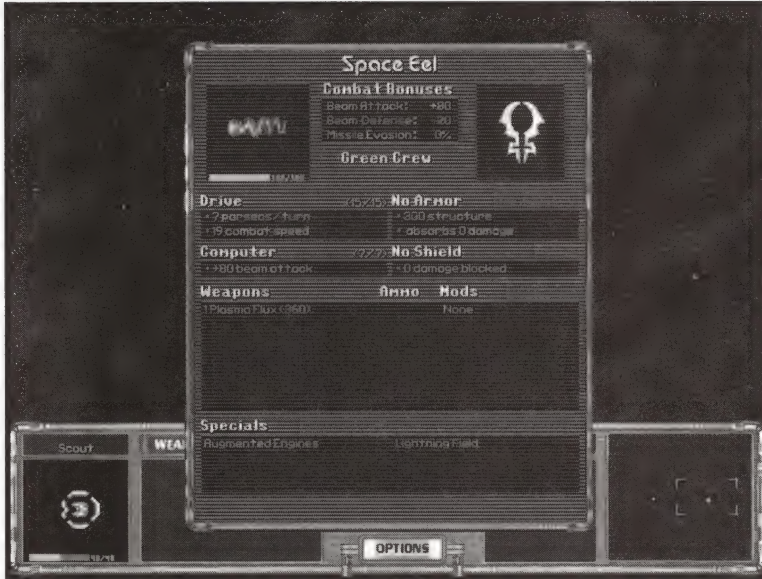
Space Dragons are equipped with these systems:

- Moleculartronic Computer
- Interphased Drive
- Eyebeam Lasers (Point Defense, 360-degree Phasors)
- Dragon Breath (300 Hit Mauler)

The regular size has 2500 hits, a Heavy Mount version of the Dragon Breath (450 damage), and 20 Eyebeam Lasers. The small Dragon has 1200 hits, only the normal 300-hit Breath, and 10 Eye Beams.

They're fast, and Dragon Breath is devastating, but not at long range. That suggests a strategy. Dragons also have no specialized defenses, except those Point Defense beams. Any beam weapon that doesn't lose coherence over distance should do well against them.

EELS

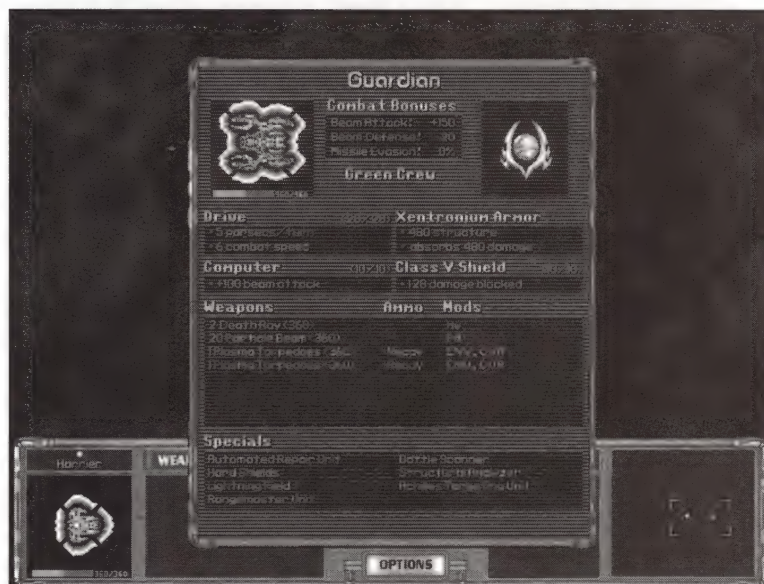


Space Eels are equipped with these systems:

- Interphased Drive
- Plasmatic Aura (Lightning Field)
- Plasma Flux (10–40 Hit per Size Class Pulsar)
- Cybertronic Computer

Small Eels have 600 hits, regular ones have 1000. The larger size also have two Plasma Fluxes. These aren't the most dangerous of the space monsters. As long as you keep your distance and don't rely too heavily on missiles and torpedoes, you should have little trouble with Eels.

GUARDIAN OF ORION



The Guardian is a Titan-class ship with the following systems installed:

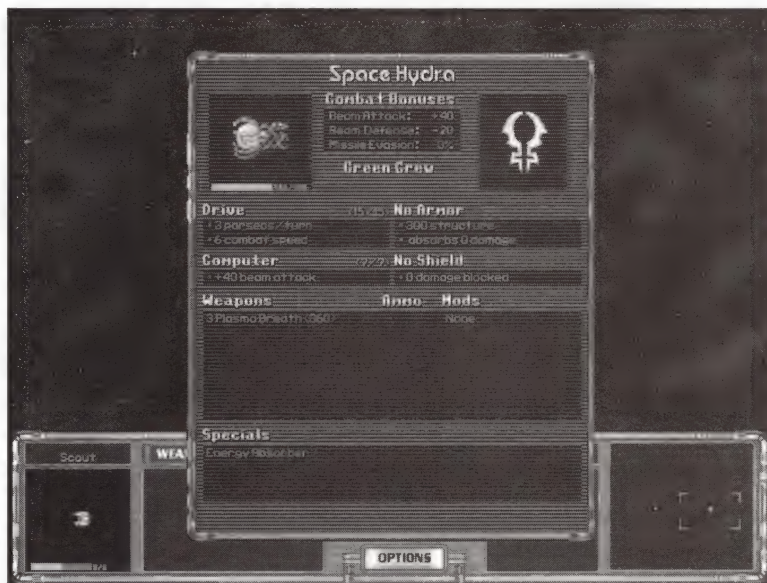
- Class V Shields
- Moleculartronic Computer
- Xentronium Armor
- Inertial Stabilizer
- Anti Matter Drive

- Multi-Wave ECM Jammer
- Rangemaster Targeting Unit
- Achilles Targeting Unit
- Automated Repair Unit
- Battle Scanner
- Hard Shields
- Lightning Field
- 2 Overloaded Enveloping Plasma Torpedoes
- 2 Heavy Mount 360-degree Death Rays
- 10 Point Defense 360-degree Particle Beams

Right away, you notice that it's heavy on defense and precision targeting. The Guardian also uses no missiles, and with the Lightning Field and all those Point Defense beams, you might as well leave yours home, too—as well as your Interceptors, Heavy Fighters, and Bombers.

Other obvious systems to not bother with against the Guardian are jammers, the Stasis Field, and the Warp Dissipator. What you *do* want are the Scout Lab, any systems that cut down the damage you take from beams, and maybe Troop Pods (because the Death Rays are going to be killing off your Marines). Pack your biggest guns, too, but nothing with a short range; you won't get that close. Getting around behind the Guardian won't make any difference, so don't even try (in other words, no stealth necessary).

HYDRAS



Space Hydras are equipped with these systems:

- Fusion Drive
- Optronic Computer
- Energy Absorber
- Plasma Breath (3 Maulers at 100 damage each)

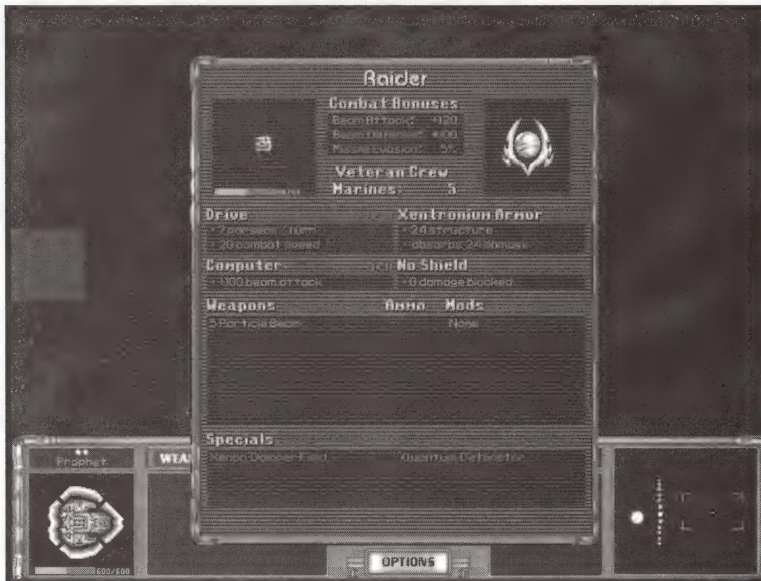
The big Hydra has 5 Heavy Mount versions of that Mauler Breath. Otherwise, the only difference is in hits—1200 for regular, 600 for small Hydras. Treat these puppies the same as you would a dragon (keep your distance), except that missiles and torpedoes work especially well against Hydras. The Energy Absorber makes your beams less attractive, after all.

ANTARANS

We saved the best for last, naturally.

Incursion Ships

The Antarans build five types of ships. Here's the rundown on each.



The Raider is the smallest vessel they make. Once you've done some research, it doesn't seem like much, but early in the game, it's a killer.

- Moleculartronic Computer
- Damper Field
- Xentronium Armor
- Quantum Detonator
- 2 Particle Beams

Next up is the Marauder, the Antaran medium ship. This one has more weapons and a couple of bombs.

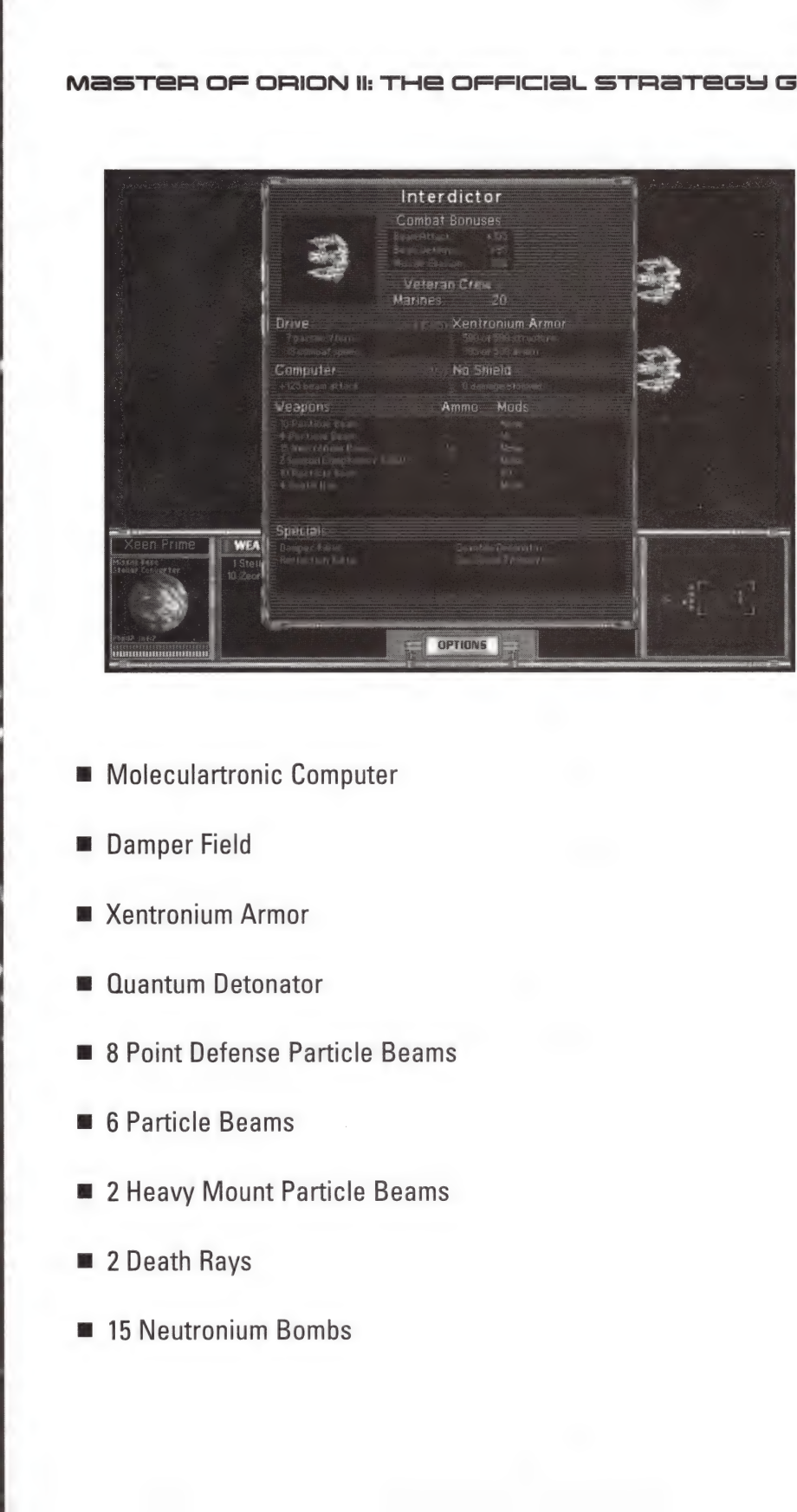


- Moleculartronic Computer
- Damper Field
- Xentronium Armor
- Quantum Detonator
- 3 Particle Beams
- 1 Heavy Mount Particle Beam
- 1 Neutronium Bomb

The large ship is the Intruder. By now, you should be noticing a pattern in the defensive setup. This vessel is the smallest one to start adding special systems like the Spatial Compressor.

- Moleculartronic Computer
- Damper Field
- Xentronium Armor
- Quantum Detonator
- 4 Particle Beams
- 2 Heavy Mount Particle Beams
- 5 Neutronium Bombs
- 3 Fighter Bays (Interceptors)
- Spatial Compressor

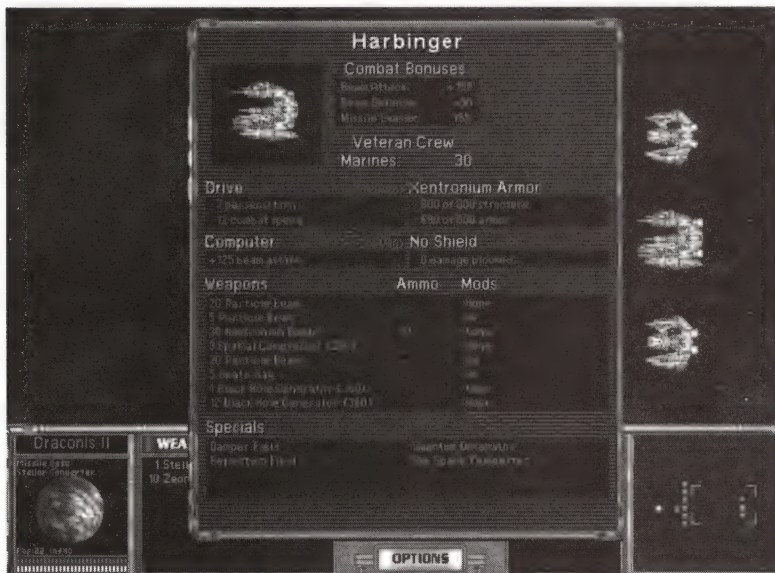
The Antarans call their huge ship the Interdictor. This one also has Spatial Compressors, plus a Subspace Teleporter. Could be they just want to pull your ships in close, but it doesn't always work that way. By the time you run into one of these, you should have serious weaponry; that's why the two biggest Antaran ships start paying a little more attention to defense.



-
- The screenshot shows the 'Interdictor' ship's stats screen. The ship is named 'Xeen Prime' and is a 'Steel Constructor'. The stats are as follows:
- Combat Bonuses:**
 - HyperAttack: +10%
 - HyperDefense: +10%
 - HyperStructure: +10%
 - Veteran Crew:**
 - Marines: 20
 - Drive:**
 - Engine: Xentronium Armor
 - Speed: 100
 - Turn: 100
 - Computer:**
 - No Shield
 - +125 beam attack
 - 0 damage received
 - Weapons:**
 - 10 Particle Beam
 - 4 Particle Beam
 - 5 Heavy Mount Beam
 - 2 Heavy Mount Beam
 - 4 Heavy Mount Beam
 - 4 Death Ray
 - Ammo:**
 - None
 - None
 - None
 - None
 - None
 - None
 - Mods:**
 - None
 - None
 - None
 - None
 - None
 - None
 - Specials:**
 - Quantum Detonator
 - Quantum Detonator
 - Quantum Detonator
- The ship is also shown in the bottom left corner of the screen, with a 'WEA' icon and a '100% Steel' indicator.

- Reflection Field
- Sub-space Teleporter
- 2 Spatial Compressors

Last and certainly not least is the Titan-class Harbinger. Capturing one of these is quite a coup, but it leads to a vicious dilemma: Scrap it for technology or use it to terrorize the entire galaxy?



- Moleculartronic Computer
- Damper Field
- Xentronium Armor
- Quantum Detonator
- 15 Point Defense Particle Beams
- 10 Particle Beams
- 2 Heavy Mount Particle Beams
- 2 Heavy Mount Death Rays
- 20 Neutronium Bombs
- Reflection Field
- Sub-space Teleporter
- 3 Spatial Compressors
- Black Hole Generator
- 6 Fighter Bays (Interceptors)

Antarans never build Doom Star-class ships. Would you really want them to?

The Home Fleet

The entire strength of the Antaran home fleet guards the Antaran home world at all times. We'd be glad to tell you the exact composition of this fleet, but we can't. Just like you, the Antarans continually add ships to their defenses. Thus, the later in the game you attack Antares, the stronger the defense you face—with one exception.

When the game begins, the Antarans have few ships and no way to breach the dimensional barrier. They soon find out how to get through, of course. Meanwhile, they're building ships in a way similar to the colonial production all the normal galactic empires go through. Whenever they decide to pop into the galaxy and attack a star system, the ships they send through come from the home fleet. Thus, the Antaran defenses get weaker.

Any ship that doesn't return from an incursion (some lucky race captured or destroyed it) is lost. Sure, they can build another one, but the point is that they're not replaced automatically. Attrition could, conceivably, destroy the Antaran home fleet completely. There's always a Star Fortress at Antares, of course.

WHAT ABOUT THE PLANET?

In combat, most of your attention necessarily rests on the enemy ships. However, all combat actions take place in a system, and the great majority of them involve a planet. (Either you're attacking a fleet that's defending a planet, or you're defending one of your worlds from an encroaching fleet.) Though the ships are the primary targets at the moment, the *real* target is the colony on the planet's surface.



Note

This is another way in which the strategy of misleading Antaran fleets to empty systems can come in handy. Any ships stuck in normal space, after all, are not defending Antares.

ATTACKING IT

What can you do to a planet during ship-to-ship combat? As much as or more than you can do afterward, except that defenders complicate your intentions. The key here is to immobilize or destroy all but the weakest of the enemy ships, then rain down damage on the colony from orbit. Of course, the planet can often do some damage to your ships, too.

Ground-Based Defense

When you get into a ship-to-ship fight, one of the first things you do is scan all the enemy ships, right? Then why not scan the planet? It has defenses, it can shoot at you, and you can scan it. Do so. Wouldn't you feel stupid if you spent all your shots on the ships and the orbital base, then got fried by the Stellar Converter on the surface? Here's a quick rundown on what you might be up against.

The Artemis System Net does its damage before combat even begins, and there's really nothing you can do about it. (If you knew it was there and could have avoided the system it's in, we assume you would have.) If your ships repair themselves between combat, your only losses are those the net destroys. If not, some of your ships enter combat damaged. There's still nothing you can do about it.

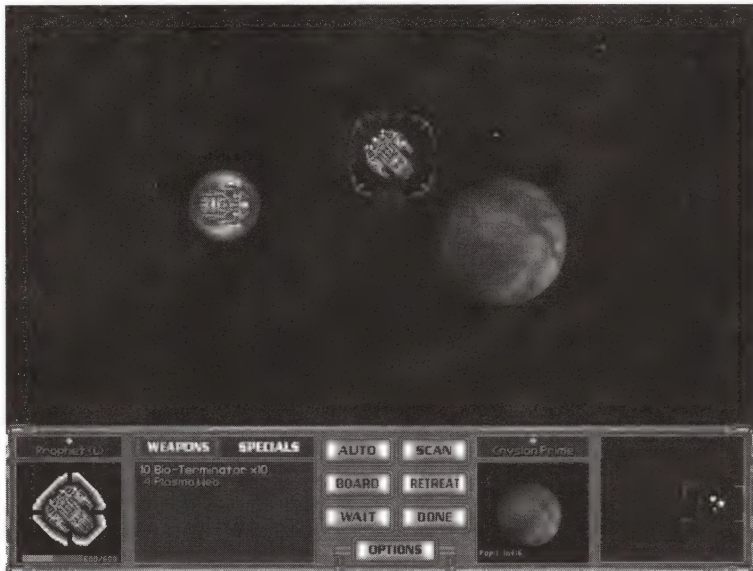
A Missile Base isn't a big threat early in the game, but as the enemy's missile technology progresses, so does the damage potential of this inexpensive building. Most colonies have one, so be on your guard. This is another reason never to forgo the ability to defend against missiles when you're designing ships.

Ground Batteries are the beam equivalent of the Missile Base. They're more expensive, but deadlier, and they don't run out of ammo. Keeping your distance helps against this one, because it suffers from all the range penalties normal ship beams do.

A Fighter Garrison poses about the same threat as a Missile Base, but like Ground Batteries, it never runs out of ammunition. You can't know what this building is going to launch at you, but at least you know it's not Assault Shuttles. Use the same defense you would against any other fighter craft.

If the colony is equipped with a Stellar Converter, run for your life. That is, unless you have a ship that can withstand it or a device to lessen its effect or nullify it. (The Reflection Field is nice for this.)

Orbital Offense



You can begin the attack on a planet during combat. In fact, if there are active planetary defenses in place, you must. Otherwise, you might not get a chance. If you have methods of immobilizing enemy ships without destroying them, using them can buy you the time you need to mount an orbital assault during ship-to-ship combat.

Take care not to destroy all the enemy ships (or put them all in stasis). Anything that ends combat takes away your chance to do some serious prebombing damage.

Any time one of your ships is within three squares of the world, that ship can train any weapon other than missiles and fighters on the colony below. (Transporters extend this range to 12 squares for the ship you installed them in.) The installations that provide the planetary defenses are always the first targets. Beams and torpedoes do only half their normal damage, due to atmospheric interference. Every bomb does full damage, according to its type. Weapons do their damage only after the planetary shield subtracts whatever amount of damage it absorbs from *each and every* weapon. When 100 points of damage have accumulated, they destroy one randomly chosen defensive installation.

After all the planetary defenses (including the shield generators) have been destroyed, bombs begin to target everything else. Each time enough damage accrues to destroy a civilian target (100 points exactly), MOO II comes up with a random number between 1 and 30. This "die roll" determines the target of that damage. (See Table 7-2.) This target is immediately considered destroyed.



Note

Just a reminder:
A Radiation

Shield absorbs 5 damage per attack.

A Flux Shield absorbs 10 damage per attack.

A Barrier Shield absorbs 20 damage per attack.

Table 7-2. Bomb Target Determination

Roll	Target
1-20	Ground Forces
21-25	Building
26-30	Population Unit



Note

When bombing after ship-to-ship

combat has finished, you're limited to the number of "Estimated Bomb Hits" the game decides is right for your fleet. During combat, however, you can bomb to your heart's content—without ever running out of ammunition. Taking advantage of this can be complicated, but the opportunity is there.

After combat, bombing is a much more organized affair. The game determines how many bomb hits your fleet can inflict; then you have the opportunity to drop as few or as many as you care to. There's no room for strategy here. You either stop dropping when the Marines and Armor are gone (then go in with your Transport Ships) or you keep it up until you've toasted the entire colony. The damage targeting is the same as for bombardment during combat. (See Table 7-2.)

Do I Use Biologicals?

The question arises: Should you use biological weapons or not? As always, the answer depends on what you stand to gain and lose. (It's not real life, so moral and ethical concerns do *not* apply.) In general, you're much better off conquering an existing colony than wiping it out and starting over with your own colonists. Colony Ships are too expensive to waste in that way. However, you might have no intention of putting up a colony on the world; some planets are more suited to one race than another. (For example, perhaps the planet has a hostile environment and the race that's there now is more environmentally tolerant than yours.) In that case, you have nothing to lose in colony terms—but do you gain?

What you gain is time. Just bombing a colony, it can take turn after turn to get rid of the population—and as long as there's one unit left alive, the colony still exists. Meanwhile, the enemy is sending a retaliation fleet. Biologicals have the advantage of efficiency; they target the population directly.

Balance this against what you lose overall. First is the research points you spend getting access to bio-weapons. Then there's the avenue of research you gave up by selecting the bio-weapon for researching. Last, using biologicals hurts your diplomatic standing with *every* race in the game. Frankly, the first two are the more important costs. (Unless you're running for Galactic Council leader, all the other races are going to end up hating you sooner or later, anyway.) If you can get biologicals by some other means, do so, but don't waste your research points on them unless you really, really like the idea.

DEFENDING COLONIES

You can safely assume that your enemy already knows everything we told you about attacking colonies during combat (especially computer-controlled enemies). With that in mind, what can you do to better defend your colonies when they're invaded?

The first thing you should do might be second nature to some of you: Know the enemy. As soon as your scanners tell you an enemy fleet is on its way to one of your colonies, click on it for a look. This helps you to know what you're up against, and it also tells you whether or not the enemy intends to actually invade the colony. If there are no Transport Ships in the incoming fleet, chances are your ground troops won't be seeing any action. That means one of three things: your ships are the actual target of the attack; the enemy just wants to destroy your colony, not capture it; or the system will soon suffer a blockade.

In Space

Once you know how many ships are coming in, you have an idea whether you can effectively protect the system. When combat starts and you scan the enemy ships, you'll have an even better idea. The odds of success determine the better strategy for defending your system.

If you think you can win—or at least get close—your strategy is simple: Obliterate the intruders. Even if you somehow lose, destroy as many enemy ships as possible. You want to make their invasion attempt costly.

If you can't win, your strategy depends somewhat on what you believe the enemy's intentions are. Unless the invasion fleet is completely overwhelming, you should engage it in combat. Otherwise, there's no way to scan the ships and try to discover the intent of the incursion. Your overall goal is to make the bombing and the ground fight as easy on your colony as possible. Failing that, you want to save your ships and come back to retake your world.

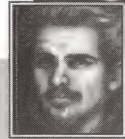
- If there are Transports in the fleet, it's likely your enemy intends to conquer.
- An enemy bent on destruction will normally have boatloads of bombs on board—or a Stellar Converter.
- An enemy intending to blockade your system will normally not carry as many bombs as one who seeks only to eliminate colonies.

In all cases, you should target the ships that carry bombs. Try to destroy those, then immediately retreat from combat—minimizing the time to use other weapons against the planet and saving what's left of your ships. As soon as you can, you're coming back with a stronger fleet—or attacking one of the enemy's systems while the invasion fleet is away from the defense!

In the long run, blockades are better for you. (You should still try to destroy the bomb-carrying ships before you retreat.) Sure, your colony produces nothing and the population might gradually starve, but you still have the colony. When you return to rout the enemy fleet, do so at a time that's advantageous for you; don't let your concern for the colony goad you into hurrying—that's playing into the enemy's hands.

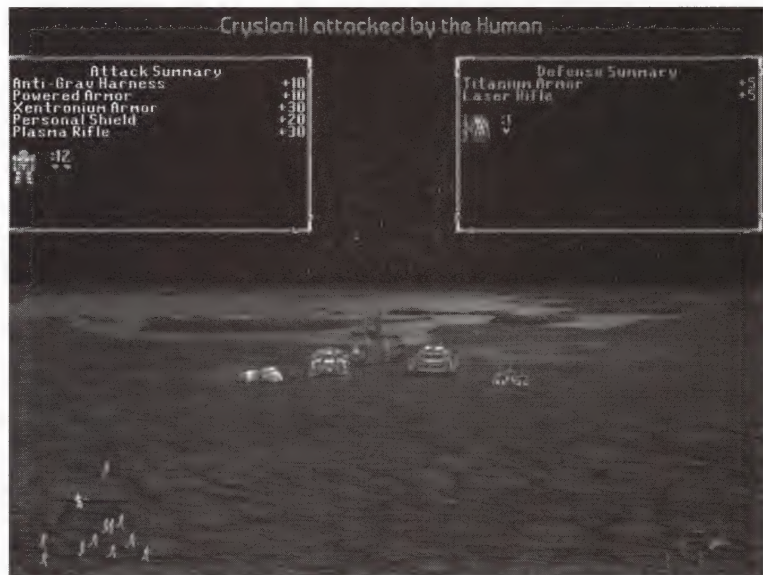
On the Ground

For better or worse, once an enemy drops Marines on one of your planets, there's nothing you can do to affect the outcome of the battle. Preparation is the only strategy. Every world—even if you don't think it's a target for invasion—should have at least a Marine Barracks. Border worlds should have Armor.



Note

Unfortunately, if there are Transports in an invasion fleet, they don't appear in combat. Therefore, there's no way you can cut down on the number of Marines that might drop on your colony. If you win the combat, you automatically eliminate the Transports, but when you can't win, you also can't give your ground troops any help.

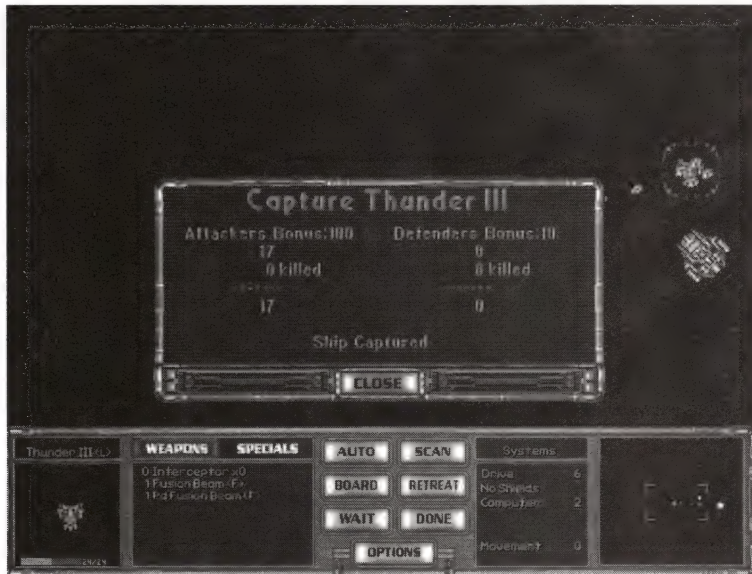


If invasions are a serious problem for you, consider changing your research goals to include some of the equipment that makes ground troops more effective—better armor, Powered Armor, rifles, Personal Shields, Anti-Grav Harnesses, and even Battleoids. If you can survive long enough, the Planetary Barrier Shield prevents invasions altogether, at least until bombing destroys it.

SPECIFIC TACTICS THAT MIGHT WORK

We can't promise that any of these will be effective in the games you play, but against the computer-controlled empires, we've had a lot of success with them.

DRIVE-BY BOARDING



Evan Birkby and the guys in QA suggested this one. It doesn't require any special technology except Assault Shuttles, which no player should ever be without, anyway. Your fastest ships should be equipped with the shuttles, and lots of 'em. Under covering fire from the other ships in the fleet, run the fast ships as directly and quickly as possible *behind* the enemy fleet. As soon as you get there, launch all the shuttles from close range. This minimizes their flight time, which cuts down on the chance they'll get blown up. They're also made safer by the fact that most fleets don't bother covering their rear with defensive firing arcs. Combine this with Back firing arcs in the fast ships for a little extra punch.



Note

If you expect to be mounting boarding actions, it can help to take out some of the defending Marines beforehand. That's what crew-killing weapons like the Neutron Blaster and the Antaran Death Ray are all about.

HIDE THE SHUTTLE

This one's almost too obvious. Once you've got Phase Cloak technology—the Cloaking Device simply won't do—combine it with massive numbers of Assault Shuttles. Remain cloaked until you're as close to the ship you want to capture as you dare get. The advantage of surprise is critical here. (Moving out of the firing arcs can allow you to get to point-blank range, which is best.) When you're in position, release all your shuttles at once. Recloak as soon as you've retrieved the surviving shuttles, then pick your next target.

WARPED BOARD

Granted, having the Time Warp Facilitator tends to turn combat in your favor anyway, but here's a deft method of putting it to work. Include one ship in the fleet that has both the facilitator and lots of Assault Shuttles. (The Troop Pods and Teleporter combination only works when one of the enemy's shields is down.) Right at the beginning of combat, take advantage of the extra turn to move that ship immediately behind the enemy ship you most want to capture (preferably one with no rear-firing arcs). Launch the shuttles from point-blank range. After they've done their duty, the leftover shuttles return to the ship. Now proceed to the next target.



Note

For tactics that require speedy

maneuvering, consider the plus to combat speed that Augmented Engines provide.

SPINNING TRACTOR PULL

Ships trapped in a Tractor Beam can still use weapons. That's perhaps the biggest drawback to this otherwise spiffy system. Of course, if the entrapping ship is outside the trapped one's firing arcs, it's not a problem. One of the most fun ways we've found of getting out of the line of fire is to *move* the line of fire. Using a Gyro Destabilizer, approach the enemy ship and spin it every turn until two things are

both true: (1) Your ship is within tractor range of the spinning enemy, and (2) the weak quarter of the target's firing arc coverage points toward your ship. That's when you break out the Tractor Beams.

If you don't have the Gyro Destabilizer, there are less dramatic alternatives. Use Augmented Engines, one of the cloaking systems, or even a Time Warp Facilitator to get behind the enemy—then *pow!*

POP GOES THE STASIS

Once again, this tactic relies on a specific special system. Install Stasis Field generators on your fleet's fastest ships. When that fleet joins in battle with an enemy fleet, zip forward with the fast ships and put as many of the enemy into stasis as you can—all but one is best. Next, destroy the last active ship at your leisure. After that, get your ships into position around another victim, and have one of your stasis ships turn off the stasis. This frees up another enemy, which you can pound mercilessly with your entire fleet. Repeat the process until all the enemy ships are history.





Tip

Multiplayer
Tip
"Pop Goes the

Stasis" might seem like a waste of time. However, it's a particularly ruthless, cruel way to totally demoralize a human opponent. How would you feel if you had to sit helplessly and watch your ships destroyed one by one?



Tip

It's a little more difficult to engineer, but the "Lure and Convert" works even better if you finish constructing the Stellar Converter *after* the enemy fleet is committed (en route to your system). If the enemy checked the planetary data before sending the fleet out, he or she almost certainly won't bother to double-check when the fleet arrives. Buying the last bits of construction works well.

LURE AND CONVERT

For this trapping tactic, you need a weak-looking fleet; one solidly defended ship often will do. Equipping that fleet with Back firing arcs helps, too. The only catch is that you must have Stellar Converter technology—and an invading enemy who doesn't bother to check the planetary info before attacking. Station the pathetic fleet in orbit around a juicy-looking colony world where you've built a Stellar Converter. When the enemy goes after the seemingly undefended prize and combat begins, turn your fleet around and head for the edge of the combat zone. (That's where the Back arcs come in handy; they let you fire while you back up.) Meanwhile, pound away at the invaders with the planet-based Stellar Converter.

ANTARAN KAMIKAZES

We've mentioned this tactic elsewhere, but it bears repeating. An enemy fleet faces off against one of yours. Right away, all your smaller, faster ships jet forward to cluster around the enemy. (The Time Warp Facilitator would help them move faster, but there are better things you can do with that device.) Without pause, they all explode at point-blank range. The damage to the enemy fleet is substantial, many times worse than expected. What happened? The Antaran Quantum Detonator, that's what.

BEAM WEAPONS BY THE NUMBERS

Most of us are satisfied to take aim at an enemy ship or missile, fire our beams, and accept the results. Hit or miss, high or low damage, we shrug our shoulders at the vagaries of war and move on. Some players, on the other hand, insist on knowing *why* and *how*. This little section is for those hard-core gamers.

RANGE PENALTIES

Throughout this book, we refer to the “Range Penalties” of beam weapons fairly often. They’re in the manual, too, but they’re not explained in any detail. Well, that’s about to change. Here are the numbers (and one equation) on how Range Penalties are calculated and applied to the accuracy and damage potential of beam weapons. Enjoy.

Accuracy

The farther away a target is, the less likely you are to hit it with a beam weapon. Several things determine the chance to hit, but it boils down to three factors: Ship Attack, Ship Defense, and Range Penalty.

Ship Attack is the MOO II way of rating the firing ship’s beam offense capability. It’s calculated based on the type of computer on board, racial bonuses, tech on board that boosts offense, and any crew bonuses.

Ship Defense is a rating of the target ship’s dodging ability. Add five times the ship’s combat speed to any racial bonuses and crew bonuses, then add in any tech boosts, and you have it.

The Range Penalty to a beam's accuracy comes from Table 7-3.

Table 7-3. To Hit Penalty by Range

Range (Squares)	Penalty
0	+10%
1-3	0%
4-6	-10%
7-9	-20%
10-12	-30%
13-15	-40%
16-18	-55%
19-21	-70%
22-24	-85%

Once MOO II sorts all those numbers out, it determines the beam's accuracy by this equation:

$$(\text{Attack \%} + \text{Penalty \%} + 10\%) - \text{Defense \%} = \% \text{ Chance To Hit}$$

Then it's a matter of chance. MOO II chooses a random number between 1 and 100 (inclusive). If that number plus the Chance To Hit is above zero, the beam strikes the target.

For example, let's say you fire a Phasor at an enemy ship. Your ship has an Optronic Computer (+40 percent) and your custom race has a +10 percent Ship Attack; the crew are Elite (+20 percent). That's a total Ship Attack of 70 percent. The enemy ship is 12 squares away, which makes a range penalty of -30 percent. Their Ion Drive gives it a combat speed of 12 (+60 percent), and the Veteran crew adds +10 percent. That's a Ship Defense of 70 percent, too. Add it up, and the chance for this Phasor to hit is $70 - 30 + 10 + 70 = -20$.

The random roll must come out greater than 20, or this one's a miss.

Damage

If a beam weapon hits, it does damage. Exactly how much damage is random, but it always falls within the range of damage of which the weapon is capable. The distance the beam must travel to the target, however, modifies the damage potential of the weapon. (See Table 7-4.)

Table 7-4. Damage Potential by Range

Range (Squares)	Damage Potential
0-3	100%
4-6	90%
7-9	80%
10-12	70%
13-15	60%
16-18	50%
19-21	40%
22-24	35%

To continue the foregoing example above, let's say the Phasor hits with a roll of 60. The normal damage for a Phasor is 5–10 points. This one was fired from 25 squares away, though, which is extremely long range. The maximum penalty applies, which reduces the damage potential to 35 percent. All fractions are rounded out, so that's 2–4 points.

The actual damage is based on the same roll as the hit. If the roll had been exactly the number needed to hit (21), the beam would do minimum damage. The higher the roll, the more damage. A 60 is about midway between the minimum (21) and maximum (100) successful rolls. Thus this hit would do 3 points of damage.

DEFENSIVE FIRE

Any non-Heavy Mount beam weapons a fleet's controller chooses not to fire during his or her offensive round remain available for automatic defensive fire. (Heavy Mounts aim far too slowly for defense.) Your weapons are out of your control during the defensive round, so how and when do they decide to fire? That depends on the range of the incoming enemy (missiles, ships and fighter craft are all valid targets).

Defensive beams *never* fire on projectiles targeted at any other ship; they're strictly self-defense. Whenever an incoming missile or fighter is about to hit the ship, every available weapon targets it. If any are left to target enemy ships, they use Table 7-5 to decide whether to fire. (When a target reaches point-blank range, it's "fire at will.")

Table 7-5. Defensive Fire by Range to Enemy Ship

Range (Squares)	Chance of Firing
1-3	100%
4-6	95%
7-9	90%
10-12	80%
13-15	70%
16-18	50%
19-21	30%
22-24	10%

Every available weapon checks against every enemy within the twenty-four-square range (at least until it's been destroyed). The accuracy and damage done by beams firing in defense is calculated exactly as for offensive beam fire. Keep in mind that Point Defense beams suffer increased penalties for range.



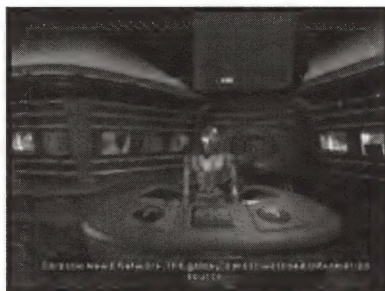


APPENDIX A

RANDOM EVENTS

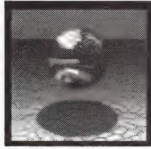


HERE THEY ARE, all the random events the designers will admit to—in case one or two haven't shown up for you yet.



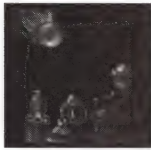
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CLIMATE CHANGE



A sudden shift in a planet's axis changes its climate to Terran.

COMET



A massive comet is on a collision course with a colony. This won't happen until you're at least 200 turns into a game, and comets never target capital colonies. You have between six and fourteen turns after its discovery before the comet hits. To prevent this, the affected empire must move ships into the system to destroy the comet. The more ships, the more quickly they obliterate the comet. How many ships is enough? That depends on the comet. The smallest are size 300, the largest size 500. (Size depends partly on the difficulty level you chose, partly on chance.) Every turn following the comet announcement, the game subtracts the combined *sizes* of the affected system's ships from the size of the comet, thus whittling down the threat bit by bit. To eliminate the biggest comet (500) in the shortest time (six turns), you'd need to station nearly thirty Medium ships in the system.

If no one destroys the comet, it does damage equivalent to bomb hits on 20 to 60 percent of the buildings and population in that colony.

COMPUTER VIRUS



A highly destructive computer virus strikes an empire's interstellar research network, destroying either *all* the Research Points applied so far toward the current scientific effort or, if you're lucky, fifty-one to 100 RPs.

DERELICT



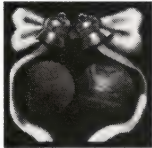
Explorers discover an ancient derelict ship, from which their race gains two free technologies—the most effective shields any race (except the Antarans, of course) has yet discovered, and a beam weapon better than any that race has yet discovered.

DIPLOMATIC BLUNDER



An ambassador to another empire commits a heinous crime, seriously jeopardizing relations with that race. This event subtracts 100 Diplomacy Points from the relations between the affected races.

DIPLOMATIC MARRIAGE



An empire offers a diplomatic marriage that will improve relations between two races. If accepted, this adds 100 Diplomacy Points to the current relations.

DONATION



A wealthy merchant donates many BCs to an empire's treasury. How many? That depends on how long the game has been underway. It's 100 BCs, plus five more for every turn elapsed so far.

EARTHQUAKE



A major quake strikes a colony, doing the same damage as bomb hits to between 20 and 50 percent of the buildings and population.

FREAK ACCIDENT



A randomly chosen military ship mysteriously explodes.

HYPERSPACE FLUX



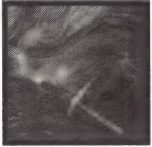
All entry into hyperspace is temporarily cut off, preventing ships—including Freighters, but not Antarans—from moving between stars. There is a five percent chance per turn that the hyperspace flux will end.

INDUSTRIAL ACCIDENT



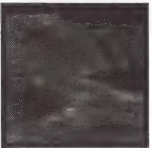
A major accident nearly wipes out an entire colony. That world suffers the equivalent of one bomb hit, then takes biological weapons damage to between 20 and 60 percent of the population.

MINERAL DEPOSIT



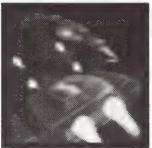
A previously unknown, rich deposit of minerals is discovered on a single planet. This boosts that planet's mineral status by two levels.

OVERWORKING



Overworking by miners unexpectedly depletes a planet's mineral resources, reducing that world's mineral status by one level.

PIRATE ACTIVITY



Pirates begin raiding colonies and disrupting trade routes in one system. (The pirate HQ is in a nearby system.) All races with at least one colony in the affected system lose one Freighter per turn until they eliminate the pirates by moving enough ships into the system to patrol effectively. Knowing when you have "enough" ships is similar to the way it works with comets. Pirate strength depends on the game difficulty level and the strength of the affected races' fleets. Getting rid of pirates entails moving lots of military ships into the system, then keeping those ships there until the raiders go away.

PIRATE RAID



Pirates raid a treasury, stealing 30 to 50 percent of its BCs.

PLAGUE



A deadly virus strikes a colony, slowly killing off colonists until research finds a cure. The planet is quarantined, prohibiting Transports from leaving the colony for fear of spreading the disease. Every turn, that world loses roughly the same number of colonists the race's growth rate would normally add to its overall population. Every Research Point the afflicted colony generates is automatically directed toward finding a cure. The strength of the plague is determined in such a way that it will last three to eighteen turns—if the emperor keeps the colony's research efforts exactly as they were when the plague struck. Doubling that world's research efforts halves the plague's duration.

Even if the emperor does nothing, the plague has a five percent chance of ending on its own every turn after the fourth.

POPULATION BOOM



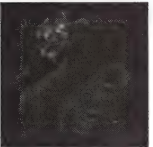
A colony's population growth rate doubles (approximately). After four turns, there is a five percent chance each turn that the growth rate will return to normal.

SERENDIPITY



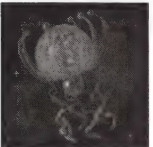
Scientists serendipitously discover the application they are working toward far ahead of schedule.

SPACE DRAGON



A vicious space dragon invades the galaxy seeking treasure. This won't happen until you're at least 300 turns into the game. Unless someone's fleet defeats it along the way, the monster will attack and destroy four colonies.

SPACE HYDRA



A horrid space hydra invades the galaxy. This won't happen until you're at least 250 turns into the game. Unless someone's fleet defeats it along the way, the monster will attack and destroy four colonies.

SPACE AMOEBA



A yucky space amoeba invades the galaxy. This won't happen until you're at least 100 turns into the game. Unless someone's fleet defeats it along the way, the monster will attack one colonized system and destroy something in it.

SPACE EEL



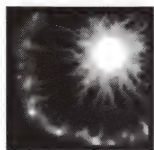
A nasty space eel invades the galaxy seeking a spawning ground. This won't happen until you're at least 150 turns into the game. Unless someone's fleet defeats it along the way, the monster will attack one colony and destroy it as it spawns.

SPACE CRYSTAL



A dangerous space crystal invades the galaxy. This won't happen until you're at least 200 turns into the game. Unless someone's fleet defeats it along the way, the monster will attack and destroy four colonies.

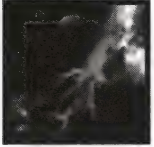
SUPERNOVA



The primary star of one system decides to blow itself up unless the colonies in the system can find a scientific solution. This won't happen until at least 200 turns have passed. If the colonies fail, all of the system's inhabitants are killed and all colonies are destroyed. All planets in the system become Radiated.

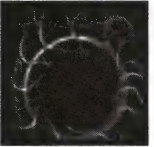
All Research Points the system generates are applied toward finding a solution. The supernova countdown takes from six to fourteen turns. This number is determined in such a way that if the emperor doesn't accelerate the colony's research efforts, the colonies will discover the solution one turn too late. How much extra research you need to prevent the explosion depends on the number of turns in the countdown—you need more research for a shorter countdown. We suggest just pouring all the colonists into research and hoping for the best.

TIME-SPACE ANOMALY



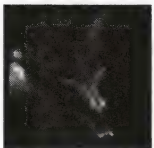
An entire star system mysteriously vanishes into another dimension. All ships in the system and all colonies are temporarily held in stasis, unable to move, grow, or produce until the anomaly passes. After it has been in effect for four turns, there is a five percent chance each turn that the anomaly will end.

UNSTABLE WORMHOLE



The sudden appearance of one end of a wormhole in the path of a traveling fleet moves that fleet to their destination in a single turn.

WARP BEAST



A beast that exists partly in real space and partly in hyperspace lurks the galaxy. For any fleet traveling between systems, there is a random chance that one ship of that fleet will be yanked into another dimension and destroyed. After it's been around for four turns, there's a five percent chance each turn the beast will go away.

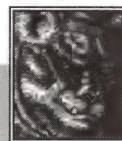


APPENDIX B

THE LEADERS



EVERY ONCE IN A WHILE, a “famous leader” pops up out of nowhere and offers to join your empire—for a price, naturally. (*Master of Magic* players will recognize this as a modified version of the “heroes” system that game employs.) You can only have eight of these leaders on your payroll at one time. More importantly, once you’ve recruited four of either type (Colony Leader or Ship Officer), *no more offer to join you*. Thus, unless you have exactly the leaders you want, you should never hire the last one without firing one of the others. Otherwise, you cut off your access to the rest.



Tip

The more leaders you have on your payroll (or waiting around), the less likely it is that new ones will come along.

DECISIONS, DECISIONS ...

When you’re choosing your eight perfect leaders, it helps to know who’s available. Each leader has a number of abilities; some are always the same and some are assigned randomly each game. Every ability has specific effects on the ship or system you assign the leader to, or on your empire as a whole. The benefits most abilities provide increase as the leader’s experience level goes up. Some leaders have a “super skill” for one or more abilities. (Table B-1 displays these in bold type.) This means that that ability’s effect is 50 percent greater than the normal ability of the same name.



Tip

If you refuse to hire a

leader when he, she, or it first appears, the manual says the leader will remain available for "a short while" in case you change your mind. This short while is 20 turns.

Once you refuse a leader, there's just as much chance of that one reappearing later (at least one experience level higher) as there is of any other.

The effects of the Megawealth and Researcher abilities are cumulative, but the rest are not. If you assign more than one leader with the same ability to the same fleet, the fleet gets the effect (for that particular ability) of the one with the best applicable bonus. The same goes for abilities affecting your empire as a whole.

The "Hire Base" column in the table below deserves an explanation. When a leader offers to join you, the named hiring price is this Hire Base multiplied by one more than the leader's current experience level. Also, we didn't list Maintenance Cost—because it's so easy to calculate (always 1 percent of the leader's hiring cost, rounded to the nearest BC).

TABLE B-1

	NAME	CLASS	HIRE BASE	STARTING LEVEL	ABILITIES
	Ailis	Gifted	100	2	Environmentalism, Spiritual Leader, Medicine
	Altos	Alkari Pilot	120	1	Helmsman , Fighter Ace, Navigator
	Androgena	None	110	2	Farming Leader, Financial Leader, Labor Leader, Medicine
	Aquasarrious	Trilarian Navigator	90	1	Navigator , Helmsman, Weaponry
	Black Razor	Enforcer	190	2	Assassin , Spy Master , Farming Leader, Labor Leader, Financial Leader
	Brainac	None	*	2	5 Random Admin Abilities
	Caern	Tulosian Mercenary	120	2	Weaponry, Helmsman, Navigator, Ordnance, Security

*Cost depends on the randomly chosen abilities.

THE LEADERS

	NAME	CLASS	HIRE BASE	STARTING LEVEL	ABILITIES
	Cassandra	Elerian Mystic	120	2	Telepath, Environmentalist, Spiritual Leader, Tech Knowledge (Telepathic Training), Diplomat
	Chug	Planetologist	90	2	Environmentalist, Researcher, Farming Leader, Tech Knowledge (Terraforming)
	Claw	Klackon Taskmaster	160	3	Farming Leader, Labor Leader Operations
	Crassis	Labor Leader	30	1	Labor Leader
	Cyr	Fighter Ace	30	1	Fighter Ace
	Dalan	Legendary Captain	300	4	Weaponry, Ordnance, Helmsman, Famous, Fighter Ace
	Dantos	Bandit Lord	400	4	Famous, Megawealth, Fighter Ace, Weaponry, Helmsman
	Diablo	Cyber Marauder	140	2	Assassin, Spy Master, Weaponry, Commando, Ordnance
	Draxx	Spy Master	100	1	Spy Master, Assassin
	Electra	High Priestess	170	4	Spiritual Leader, Environmentalist, Telepath, Farming Leader
	Emo	Science Leader	30	1	Science Leader
	Fellina	Naturalist	100	2	Environmentalist, Farming Leader
	Galis	Financial Leader	30	1	Financial Leader
	Garron	Ambassador	80	1	Diplomat, Famous, Megawealth

	NAME	CLASS	HIRE BASE	STARTING LEVEL	ABILITIES
	Gizmo	Gadgeteer	50	1	Engineer, Researcher
	Grak	Bulrathi Commando	110	2	Commando , Security, Famous, Operations
	Grum	Armsman	40	1	Security, Commando
	Hawk	Astrogator	50	1	Helmsman, Navigator
	Houri	Environmentalist	40	1	Environmentalist
	Jarred	Explorer	100	2	Navigator , Diplomat, Weaponry, Helmsman
	Karg	Pirate Captain	260	3	Navigator, Weaponry, Ordnance, Galactic Lore, Helmsman
	Kher	Smuggler	100	2	Weaponry, Helmsman, Navigator, Trader
	Khunagg	Ruthless	90	2	Farming Leader, Labor Leader, Tactics, Commando
	Kimbuzzi	Farming Leader	30	1	Farming Leader
	Kirsus	Pylon Scientist	100	2	Science Leader, Researcher
	Kronos	Ancient Spacefarer	130	3	Navigator , Helmsman, Galactic Lore , Tech Knowledge (Dimensional Portal)
	Kytryl	Privateer	170	2	Helmsman , Weaponry, Navigator , Famous, Trader
	Loknar	Last Orion*	300	6	Weaponry, Ordnance, Galactic Lore, Helmsman, Fighter Ace

* Loknar the Last Orion will offer to join the race that defeats the Guardian and first conquers Orion. He comes with a ship of his own. Loknar has vowed to destroy the Antaran race utterly—or die trying.

THE LEADERS

	NAME	CLASS	HIRE BASE	STARTING LEVEL	ABILITIES
	Lydon	Noble	60	1	Diplomat, Famous, Megawealth
	Malovane	Battle Lord	240	4	Spiritual Leader, Labor Leader, Commando, Instructor, Tactics
	Matrix	Cyber Mage	200	3	Science Leader, Spiritual Leader, Telepath, Assassin
	Megatron	Relic Android	210	3	Farming Leader, Science Leader, Labor Leader, Tech Knowledge (all androids)
	Mentox	Legendary Scientist	170	3	Science Leader, Researcher, Famous, Tech Knowledge (Research Lab, Autolab)
	Mukirr	Mrrshan Warrior	90	2	Weaponry, Commando
	Mystic X	Unknown	*	3	8 Random Non-Admin Abilities
	Necron	Dark Lord	300	4	Financial Leader, Labor Leader, Science Leader, Telepath, Spiritual Leader
	Nhagg	Armsmaster	150	2	Commando, Ordnance, Weaponry
	Nile	Forsaken Warrior	140	2	Commando, Security, Weaponry
	Nimraaz	Master Tactician	150	2	Operations, Tactics, Instructor, Commando
	Orphus	Peacemaker	200	3	Diplomat, Weaponry, Ordnance, Helmsman, Famous
	Ralleia	Siren	120	2	Famous, Diplomat, Spiritual Leader

*Cost depends on the randomly chosen abilities.

	NAME	CLASS	HIRE BASE	STARTING LEVEL	ABILITIES
	Rash-Iki	Warlord	110	2	Tactics, Commando, Instructor , Labor Leader
	Ruola	Weapons Officer	30	1	Weaponry
	Skaine	Legendary Pilot	220	3	Fighter Ace , Helmsman , Weaponry, Navigator, Famous
	Slag	Arms Dealer	240	2	Trader , Navigator, Weaponry, Helmsman, Megawealth
	Slith	Rebel Pilot	110	2	Weaponry, Navigator, Helmsman, Ordnance
	Sparky	Meklar Cybernaut	100	1	Engineer , Ordnance, Tech Knowledge (Advanced Damage Control)
	Tanus	Revolutionary	160	3	Farming Leader, Labor Leader, Science Leader, Spiritual Leader, Tech Knowledge (Advanced Government)
	Tellik	Legendary Engineer	240	4	Engineer , Ordnance , Researcher , Famous , Operations
	Torg	Overlord	190	3	Farming Leader , Labor Leader , Financial Leader , Commando
	Tulock	Bounty Hunter	200	3	Weaponry , Commando, Helmsman , Navigator, Assassin
	Tyranous	Sakkra Armsman	70	2	Weaponry, Commando, Security
	Urro	Ikarian Doctor	60	1	Medicine , Researcher
	V'larr	Independent Trader	160	1	Navigator, Helmsman, Megawealth, Weaponry

THE LEADERS

	NAME	CLASS	HIRE BASE	STARTING LEVEL	ABILITIES
	Valin	Rogue Trader	140	2	Megawealth, Trader , Financial Leader
	Vott	Technomancer	380	3	Science Leader , Financial Leader , Megawealth, Researcher , Tech Knowledge (Virtual Reality Network)
	Xantus	Supreme Leader	300	4	Spiritual Leader , Financial Leader , Labor Leader , Environmental , Science Leader
	Yota	Elder Sensei	60	1	Instructor , Famous
	Zog	Gnolam Capitalist	180	2	Financial Leader , Labor Leader , Megawealth

Listing these abilities is all well and good, but what effects do they have in game terms? (We note the Admin abilities because it makes a difference when choosing the randomly selected abilities.)

Assassin

Has a 2 percent chance per experience level to assassinate one random enemy agent each turn.

Commando

Gives +2 per experience level to the Ground Combat bonus of every troop in the system. The leader may be assigned to the system itself or to a ship in the system for the bonus to take effect.

Diplomat

Gives +10 diplomatic points per experience level to negotiations with all enemy empires.

Engineer

Increases the restoration rate of the assigned ship's shields by 5 per experience level. Repairs 2 percent of Structural Hits and 1 percent of other hits each turn of combat. Repairs all structural and system damage after a battle.

Environmentalism

Reduces production pollution for all planets in the assigned system by 10 percent per experience level (Admin ability).

Famous

Increases the chance of recruiting other leaders. Decreases the hiring cost of new leaders by 60 BC per experience level.

Farming Leader

Increases the amount of food grown on all colonies in the assigned system by 10 percent per experience level (Admin ability).

Fighter Ace

Increases beam weapon damage and Ship Defense for every vessel in the assigned ship's fleet by 5 percent per experience level.

Financial Leader

Increases the income earned from all colonies in the assigned system by 10 percent per experience level (Admin ability).

Galactic Lore

When first hired, reveals the environmental data for every planet in the game. All ships in the assigned ship's fleet gain +5 Ship Attack and Ship Defense when battling space monsters or Antarans.

Helmsman

Increases the Ship Defense bonus of all ships in the same fleet by 5 per experience level.

Instructor

Adds 1 experience point per experience level every turn to all ship crews and leaders in your empire (Admin ability).

Labor Leader

Increases factory worker productivity in the assigned system by 10 percent per experience level (Admin ability).

Medicine

Increases the population growth rate of all planets in the assigned system by 10 percent per experience level (Admin ability).

Megawealth

The leader is independently wealthy and requires no upkeep. Contributes 10 BC to your empire each turn.

Navigator

All ships in the same fleet with the assigned ship suffer no movement restrictions in nebulae or near black holes. Also increases their speed by 1 parsec per turn for every 2 experience levels.

Operations

Decreases the assigned fleet's upkeep Command Rating by 2 per experience level.

Ordinance

Increases the assigned ship's maximum attack damage by 5 percent per experience level.

Researcher

Each turn, generates 5 research points per experience level.

Science Leader

Increases the research in all your colonies in the assigned system by 10 percent per experience level (Admin ability).

Security

When enemy Marines board the assigned ship, increases the combat strength of defending Marines by +2 per experience level.

Spiritual Leader

Increases the morale rating of all planets in the assigned system by 5 percent per experience level (Admin ability).

Spy Master

Increases the Spying bonus for all friendly spies by +2 per experience level.

Tactics

Improves the Ship Attack of all friendly ships in the assigned system by +2 per experience level. Gives a +1 Ground Combat bonus to all planets in the same system (Admin ability).

Tech Knowledge

Reveals the secret of one particular application (sometimes more) when first hired.

Telepath

Gives a Spying bonus to all defensive agents of +2 per leader experience level. Negates the effects of opponents' Telepathy in the assigned system.

Trader

Increases the money brought in via trade agreements by 10 percent per experience level.

Weaponry

Increases the Ship Attack of the assigned ship by +5 per experience level.

What are these "experience levels" anyway? They're like the levels a ship's crew gains. Each turn, a leader gains 1 experience point (plus the Instructor bonus, if there is one). In addition, any leader who participates in combat gets 2 experience points for every enemy ship captured or destroyed during that combat. Table B-2 shows the progression from a leader's starting level.

TABLE B-2

LEVEL	FLEET TITLE	COLONIAL TITLE	EXP. NEEDED: NORMAL	EXP. NEEDED: WARLORD
1	Commander	Bureaucrat	30	_____
2	Captain	Administrator	90	30
3	Commodore	Director	180	90
4	Rear Admiral	Magistrate	300	180
5	Admiral	Commissioner	500	300
6	Grand Admiral	Governor	1000	500
7*	Lord Admiral	Lord	_____	1000

*Only leaders hired by a Warlord race can attain the seventh level.



APPENDIX C

THE CHEAT CODES



AS WE PROMISED EARLY in this book, here are all the known cheat codes for *Master of Orion II*. To use a cheat code in MOO II, just hold down the **[Alt]** key while you type in the code.

Code	Use at	Effect
canonly1	Galaxy Map	Unites all the computer opponents in a war against you.
crunch	Colony Screen	Finishes your current building project at that colony.
einstein	Galaxy Map	Grants your empire knowledge of <i>every</i> application in <i>every</i> field of research, except for the Hyper-Advanced fields.
iseeall	Galaxy Map	Toggles Omniscience on and off.
menlo	Galaxy Map	Finishes your current research project.
moola	Galaxy Map	Adds 1000 BC to your imperial treasury.

Keep in mind that if you use any one of these during a game, your final score is reduced to zero. You have been warned.



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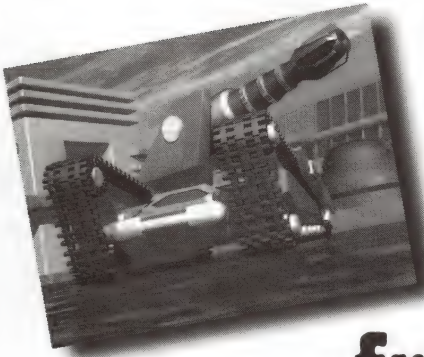
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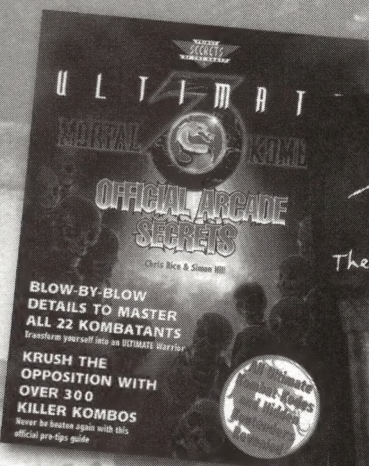


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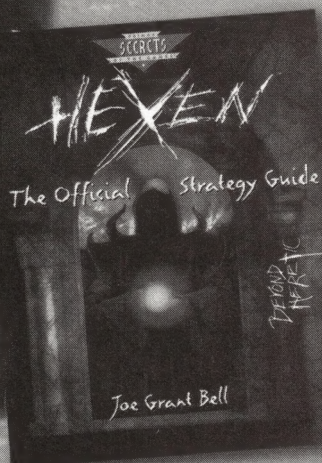
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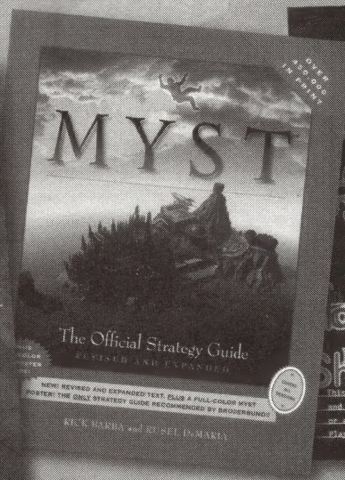
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